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Visitor Attitudes Toward Use Control Wilderness Regulations and Wilderness Policies in the Bob Marshall Wilderness complex

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VISITOR ATTITUDES TOWARD USE CONTROL, WILDERNESS REGULATIONS, AND WILDERNESS POLICIES IN THE BOB MARSHALL WILDERNESS COMPLEX

By

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Recreational use is one of the values of wilderness. As this use increases, impacts occur both on the resources and on visitors' experiences. In order to achieve the dual goals of preservation and quality recreation, management becomes necessary and important, especially the management of visitors.

Freedom, spontaneity and escape characterize wilderness recreation. Managing visitors through light-handed approaches, such as providing information and education programs, are more favored by visitors than such direct approaches as regulation, enforcement and use controls. However, visitors do perceive direct approaches of use control and regulation of behavior as necessary and acceptable if the quality of wilderness recreation is getting worse after light-handed programs are implemented.

Visitor attitudes toward some of the use control approaches, wilderness regulations and wilderness management policies are different because of their beliefs about wilderness, their backgrounds (e.g., education levels, past experiences), travel methods, use types, and their perceptions of impacts. Fishbein, Ajzen and Iso-Ahola's conceptual framework regarding the relationships between antecedents, beliefs, attitudes, intentions, and behaviors has demonstrated its appropriateness to this study.

Although attitude is not necessarily effective predictor of behavior, it can serve managers as a reference in their decision-making processes. Some further research and management implications are suggested.

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Chapter 1

Introduction

1.1. Problem definition

Since entering the twentieth century, the development of human civilization has proceeded much faster than at any other time in history, especially in the areas of science and technology. People's lives have been improved in several ways such as comfortable accommodation, convenient transportation and effective medical care. At the same time, however, many problems have appeared, such as air and water pollution, exploitation of natural resources and social problems.

Owing to the fast growth of world population, many natural resources on the earth now face tremendous pressure from improper or conflicting use. For instance, forest lands are diminished because of timber harvest and agricultural cultivation, rivers are dammed for water supply and electricity, scenic areas are developed for tourism. Most of these economic developments of natural resources are based on people's pursuit of economic growth rather than survival (Langenau et al. 1984). Therefore, not only scenic areas and wildlife species have gradually disappeared but also man's environment itself has been threatened.

In order to protect our natural heritage from being settled and destroyed, so that future generations can enjoy these untrammelled areas, some far-sighted people advocated the idea of preservation and tried to influence people's beliefs

and to gain their support. The first national park, known as The Yellowstone National Park, established in 1872, represented a great victory in preservation history. Today, preservation concepts and actions have become an international trend, with more people supporting preservation campaigns and more protected areas being designated. In 1964, when the U.S. Congress passed the Wilderness Act, the concepts of preservation were not only based on scenic reasons but also on ecological and environmental considerations.

The Wilderness Act of 1964 stated that the national wilderness system is to be preserved for "use and enjoyment as wilderness" by "the American people of present and future generations". Wilderness has many values to be protected from development, and most of these values are based on some kind of use. The most obvious use is recreational use, including many diverse activities such as backpacking, hunting, fishing, boating, and horse riding (Hendee et al. 1978). People have diverse motives for visiting a particular area. They often seek a variety of recreational experiences consistent with their preferences and they obtain various types of satisfaction which directly benefit them and ultimately society as well.

Quality recreation, producing desired satisfactions and benefits for participants, is the objective and concern of both managers and recreationists (Clark and Stankey 1979). Because quality is a human concept based on highly subjective criteria, we can expect varied perceptions about quality among people. A recreation opportunity is based on three available settings, they include the physical-biological, social, and managerial settings (Clark and Stankey 1979). With

growing numbers of people on limited recreation areas, it will require increasing amounts of management to maintain quality.

It seems unavoidable that some impact will result from people's participation in recreational activities in wilderness areas. For instance, we can expect loss of ground cover and compacted soils, numerous blackened fire rings, littering and garbage, improper disposal of human waste, chopping of trees and branches for firewood, trees and root systems severely damaged by horses and soil erosion on trails. In addition to physical impacts, social impact is also an important factor of the quality of recreation experience. For instance, high use density can cause a loss of solitude (Krumpe 1979), and user conflict can occur between different activities.

Because humans are the main producer of wilderness recreation impacts, wilderness management is essentially the management of human use to promote the preservation of naturalness and solitude. Several wilderness recreation researchers have documented the importance of visitor management in wilderness areas and have provided various techniques and strategies for managing visitors (Hammitt et al.1982). The management approaches can be heavy-handed or direct such as regulation enforcement, and light-handed or indirect such as information dissemination and education programs.

Since values such as freedom, spontaneity and escape are important to many wilderness visitors, a manager should remember that direct or authoritarian approaches can significantly alter the experience of visitors. However, if the quality of a wilderness area is getting worse because of high use or visitor's

inappropriate behavior, people might perceive direct control by regulations as a necessary approach. Successful visitor management depends partially on the degree to which visitors perceive that management controls are needed and on their feeling of the appropriateness of specific management strategies (Hammitt et al. 1982).

Recreation should be enjoyable and rewarding for people. Any regulations put into effect should contribute to the enjoyment of visitor's experiences in the long run, rather than be for the convenience of administrators (Lucas 1982). Thus, visitors' attitudes toward direct wilderness management approaches such as regulations, use control, and some wilderness management policies, need to be considered as part of effective visitor management.

1.2. Problem statement

The Bob Marshall Wilderness Complex consists of three contiguous National Forest Wilderness areas -- the Bob Marshall, the Great Bear, and the Scapegoat -- on both sides of the Continental Divide in the Rocky Mountains south of Glacier National Park, with a total of a little more than one and half million acres of wild land (Lucas 1985). The Bob Marshall Wilderness Complex possesses much of what we commonly ascribe to wilderness and is truly a national treasure (McCool 1984).

Each year, thousands of visitors come to this area to engage in backpacking, horseback riding, white water rafting, hunting, and fishing. People might experience setting deterioration and loss of solitude as use levels increase and concentrate in certain heavily used parts of wilderness. How to reach the dual

goal of providing both preservation and use has received increasing attention from managers, users, and researchers.

An approach to redistributing use through information dissemination has been advocated and has achieved varying degrees of success (William and Huffman 1985). This approach provides users with information through computer terminals or brochures about various attributes of the backcountry areas as a way to help users make their trip decisions. For example, Krumpe's (1979) study in Yellowstone National Park found that about one third of the users had chosen an alternative entry point as the brochure suggested.

However, this approach might risk dispersing impacts throughout the whole wilderness area because of visitors' inappropriate behavior resulting from ignorance, carelessness, personal convenience, or maliciousness. Meanwhile, we will ask: Does this approach really reduce use level in the heavily used area? Those who are more tolerant to impacts such as high use density might simply displace those who are distributed to other lightly used areas and the use level may still remain high in the original heavily used area (Heberlein 1977). Another possibility is that a popular area with a high use level may have some unique attributes that other lightly used areas do not possess.

Based on the reasons described above, it is probably more important to modify visitors' behaviors than just to redistribute them. Because most wilderness users prefer indirect management (Hendee et al. 1978), most visitor management strategies have emphasized indirect means of influencing or modifying user behavior rather than direct methods which aim at regulation and overt control of

visitors (William et al. 1982).

Because it is uncertain that light-handed methods will solve all impact problems in wilderness areas. A manager should bear in mind that once the light-handed methods prove to be ineffective and unable to achieve management objectives, direct approaches will become necessary. However, careful use of light-handed approaches could delay the need to impose direct controls for some time.

In the process of designing direct management programs, it is important for a manager to understand people's perception or attitude toward regulations and use controls. Obtaining visitors' cooperation in order to maintain high quality settings is crucial; managers cannot do it by themselves. Programs founded upon information about what users consider desirable will likely receive more support and be more effectively implemented.

1.3. Objectives

The purpose of this study is to investigate visitor attitudes toward direct management approaches and some management policies in the BMWC. Through the comparisons among different independent variables, such as visitor beliefs about wilderness, travel methods, backgrounds, perceptions of impacts, etc., I hope that some knowledge about the visitors to the BMWC can be obtained and some management implications can be reached.

The objectives of this study include:

1. Determine the important social-psychological outcomes among visitors to the Bob Marshall Wilderness Complex (BMWC), and how these

outcomes are related to visitor attitudes toward wilderness regulations, use control and wilderness management policies.

2. Identify how visitors to the BMWC perceive wilderness regulations, use control and wilderness management policies in terms of their desirability.

3. Compare visitors with different backgrounds such as education levels, past experience, and residence, to determine if they hold different attitudes toward wilderness regulations, use control and wilderness management policies.

4. Compare visitors with different perceptions about wilderness problems such as use conflict, physical and social impacts, to determine if they hold different attitudes toward wilderness regulations, use control and wilderness management policies.

5. Suggest some management implications by referring to the results of this study.

Chapter 2

Conceptual Framework and Literature Review

2.1. Conceptual framework

The conceptual framework used in this study was developed by Fishbein and Ajzen (1975) and supported by Iso-Ahola (1980). Because of the limitation of available data, this study focused on attitude and its relative variables. Four subsections are discussed in this section, including 1) Definition of attitude, 2) The nature of attitude, 3) Fishbein and Ajzen model, and 4) Study hypotheses.

2.1.1. Definition of attitude

Social psychologists have investigated attitude for over five decades and have given various definitions to the term (Heberlein 1973). For example, as early as 1935, Gordon Allport defined an attitude as "A mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (Halloran 1967). Krech et al. defined attitude as "an enduring system of positive or negative evaluations, emotional feelings and pro or con action tendencies, with respect to a social object" (Halloran 1967). Fishbein and Ajzen (1975) defined attitude as a person's favorable or unfavorable evaluation of an object. It is obvious that these definitions describe attitude as a mental state toward some object.

2.1.2. The nature of attitude

Theorists such as Krech et al.(1962), Triandis (1967), Fishbein and Raven (1967) have differentiated attitude into three separate components: cognitive, affective, and behavioral. The cognitive component involves beliefs about an object, including evaluative beliefs that it is good or bad, appropriate or inappropriate, and so on. The affective or feeling component has to do with likes or dislikes and is an emotional response toward an object. The behavioral component includes the readiness to behave in a particular way associated with an attitude, but does not cover the actual behavior itself.

The theoretical framework developed by Krech et al. displays a schematic conception of attitude (figure 1). The place of attitude within this framework can be described in this way: when an individual is exposed to a situation, he or she may select some of the available stimuli and neglect others; then they interpret the selected stimuli in certain ways (cognition) and react to the interpreted stimuli affectively and by behavioral tendencies that will emerge as behavior under appropriate environmental conditions.

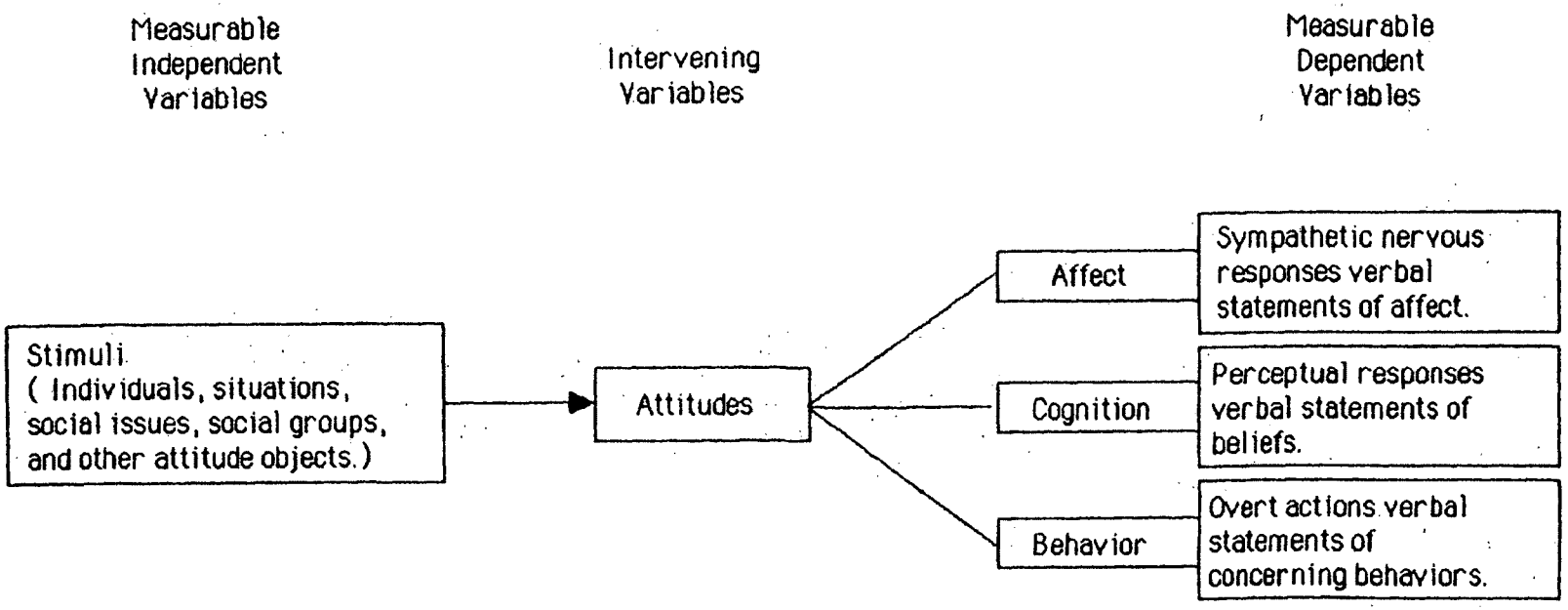


Figure 1.
Schematic conception of attitudes (Halloran 1967).

2.1.3. Fishbein and Ajzen's model

Fishbein and Ajzen developed a model regarding the relationship between beliefs, attitudes, intentions and behaviors (figure 2). They have designated beliefs as the foundation of this model. On the basis of direct observation or information received from outside sources or by way of various inference processes, individuals learn or form a number of beliefs about an object through an information-processing approach with which they evaluate the attributes of that object. The subsequent attitude toward an object is based on those beliefs that are salient. For example, an individual's attitude toward wilderness is a function of his or her beliefs about wilderness.

A person's attitude toward an object may be positive if his or her beliefs associate that object with primarily favorable attributes. Conversely, a negative attitude will result if his or her beliefs associate that object with unfavorable attributes. Fishbein and Ajzen state that most people hold both positive and negative beliefs about an object, and attitude is viewed as corresponding to the total affect associated with their beliefs. Therefore, in terms of the relation between beliefs and attitudes, they emphasize that a person's attitude toward an object is related to a set of his or her beliefs about that object rather than to any specific belief.

An intention is the subjective probability that a person will perform a certain behavior. A person's intentions to perform a variety of behaviors with respect to an object are related to their attitudes toward that object. This attitude leads to a set of intentions rather than any specific intention. For example, a person holding

a positive attitude toward wilderness may intend to camp in a wilderness area or to support campaigns for wilderness preservation. Because each intention is viewed as being related to the corresponding behavior, it follows that attitude toward an object will again be related to the total behavioral pattern rather than to any specific behavior. Thus, a person's attitude is assumed to be related to the total affect associated with his or her beliefs, intentions and behaviors.

Fishbein and Ajzen point out that there are feedback loops at various stages of the process. For example, once established, an attitude may influence the formation of new beliefs; similarly, performance of a particular behavior may lead to new beliefs about the object, which may in turn influence the attitude.

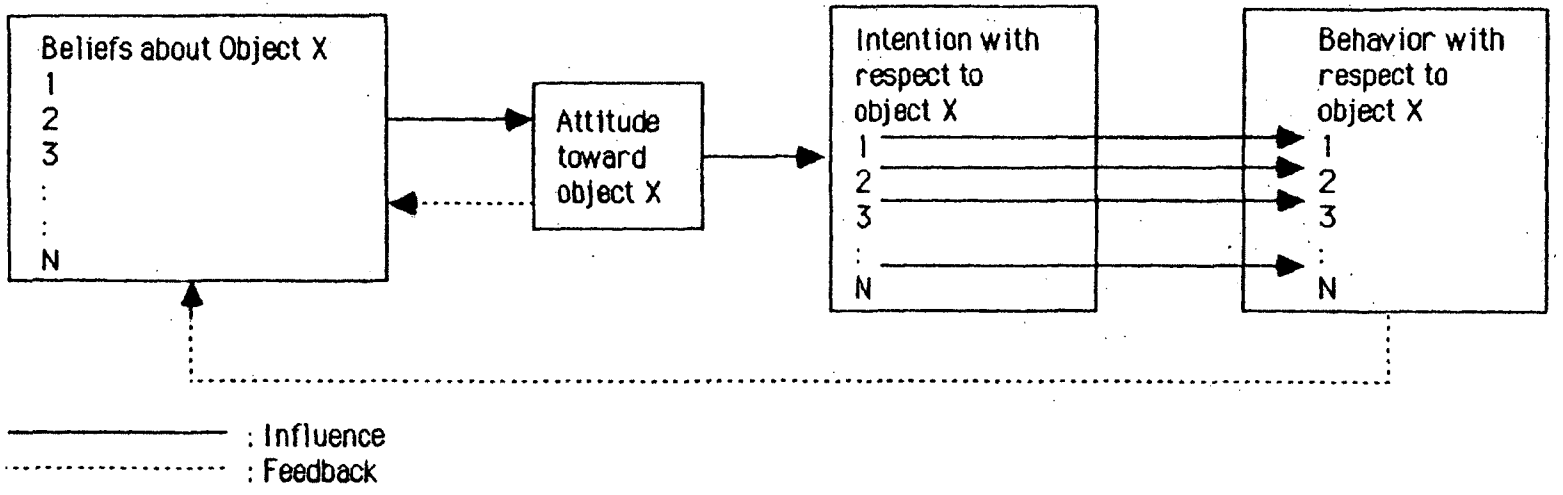


Figure 2 .
Schematic presentation of conceptual framework relating beliefs, attitudes, intentiions and behaviors with respect to a given object (Fishbein and Ajzen 1975).

Iso-Ahola (1980) adapted the Fishbein-Ajzen conceptualization and added various antecedents (e.g., situational and social influences, past experiences, and individual differences) before the stage of belief. He emphasizes that various antecedents will give rise to beliefs. Iso-Ahola's revised model is shown in figure 3.

Although Fishbein and Ajzen didn't put the antecedent factors ahead of beliefs, they discussed how past experiences affect attitudes. They pointed out that attitudes are learned by assuming that attitudes, responding in consistently favorable or unfavorable ways, are the results of past experience. Social influences such as social approval or disapproval are emphasized in the investigation of attitudes and behaviors. Thus, these two models are basically similar in terms of their contents.

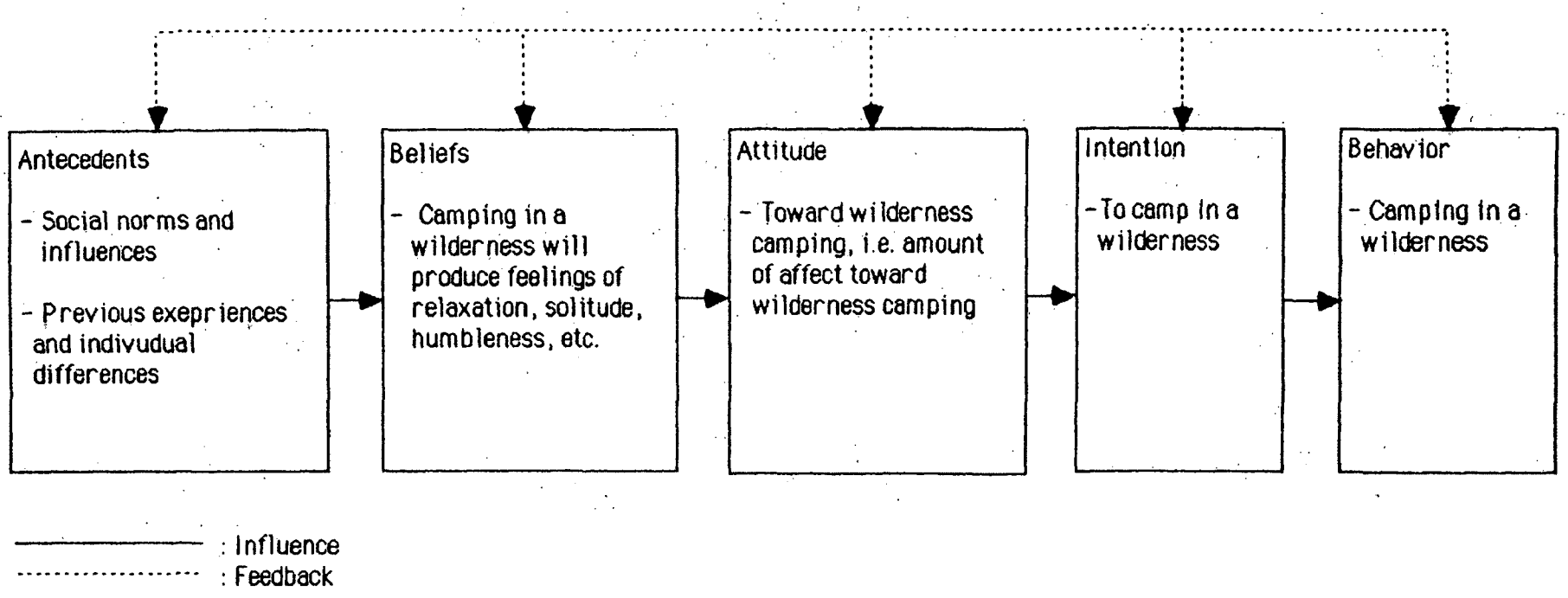


Figure 3. Conceptualization of leisure attitude (Iso-Ahola, 1980).

2.1.4. Study hypotheses

People visit a particular recreation area with several expected social-psychological outcomes (their beliefs about that area) to seek various experiences which lead to satisfaction. To determine how different beliefs affect attitudes, two hypotheses were tested:

> H 1) Attitudes of visitors to the BMWC toward use control, wilderness regulations and wilderness policies are not different between those who perceive consumptive reasons (fishing and hunting) as "very important" or "somewhat important" and those who don't.

> H 2) Visitors' attitudes toward use control, wilderness regulations and wilderness policies are not different between visitors who perceive different degrees of the importance of wilderness.

According to Iso-Ahola's (1980) framework, various antecedents will give rise to beliefs, which in turn result in attitudes toward an object. Another hypothesis was tested:

> H 3) Visitors' attitudes toward use control, wilderness regulations and wilderness policies do not differ among visitors with different backgrounds (e.g., education levels, current residence, and experience of wilderness trips).

In addition, because of the feedback loops in this framework as mentioned before, behaviors may influence beliefs and in turn influence attitudes toward an object. Thus, four more hypotheses were tested.

> H 4) There are no significant differences in the attitudes toward use control, wilderness regulations, and wilderness policies between hikers and horse users.

> H 5) There are no significant differences in the attitudes toward use control, wilderness regulations, and wilderness policies between day-users and campers.

H 6) There are no significant differences in attitudes toward use control, wilderness regulations, and wilderness policies between hikers who perceived use conflict with horse users and those hikers who didn't.

H 7) There are no significant differences in attitudes toward use control, wilderness regulations, and wilderness policies between visitors who perceived bio-physical and social impacts and those who didn't in the BMWC.

2.2. Literature review

As mentioned earlier, an attitude is a result of beliefs about an object obtained through a person's evaluation of attributes of that object (Fishbein abd Ajzen 1975). To understand wilderness visitor attitudes toward wilderness management, it is very important to know how they define wilderness. People may define wilderness in a variety of viewpoints ranging from a narrow legal perspective as described in the Wilderness Act of 1964 to whatever they think it is (Robertson 1981). Different perceptions of wilderness may lead to different attitudes toward it. This variety of attitudes makes it difficult for managers to interpret and incorporate visitor desires in decisionmaking when certain attitudes are inconsistent with some constraints that the managers must take into account (Stankey 1973).

Carrying capacity is a common term in recreation management. Traditionally, it emphasizes the amount of acceptable use in a certain area. However, this specific number is only one factor weakly related to wilderness conditions. For example, camping impact on vegetation can be explained by several factors such as travel methods, camping behavior, and use intensity etc.. An alternative model of carrying capacity calls for the establishment of limits in the change that may

occur in the ecological and social qualities of a recreational opportunity (Frissell and Stankey 1972, McCool, et al. 1984). This model presents more precise consideration of the whole situation in a recreational area rather than only a specific number. Washburne (1982) offered an alternative approach to assessing wilderness carrying capacity, he also emphasized establishing standards for acceptable conditions.

Either carrying capacity or the LAC (Limits of Acceptable Change) concept is concerned about use level and its subsequent impacts in the wilderness area, and both of them can directly affect the quality of wilderness recreation. Therefore, before any use control approaches or direct programs are implemented, the managers must have a clear definition of use level and impacts.

Stankey (1980) compared visitor perceptions of carrying capacity in two wilderness areas - the heavily used Desolation Wilderness in California and the lightly used Spanish Peaks Primitive Area in Montana. He found that Desolation visitors, exposed to higher use levels, have become more tolerant of heavy use than their Spanish Peaks counterparts. Encounters may affect visitor perceptions of carrying capacity and therefore the satisfaction of their wilderness trip. Stankey's study (1973) indicated that 56 percent of sampled visitors in his four study areas agreed meeting no others was most enjoyable during their wilderness trips. However, a closer examination of responses indicated differences existed among visitors. For instance, motorboaters or motor canoeists didn't care so much about encoutering others as paddling canoeists.

Facing continuous growth in use on a relatively fixed resource base,

managers seem unlikely to achieve the goals defined in the Wilderness Act unless some management actions are taken (Stankey 1977). If wilderness conditions cannot be adequately protected after intensive management, control of use may become necessary. Stankey (1973) solicited the attitudes of visitors to a series of techniques that could be utilized by managers to regulate use. These techniques are: (1) direct rationing techniques including the first come, first served system; lottery; mail reservation system; campsite assignment; and entrance fee. (2) indirect rationing techniques including reduction of signs and trails; manipulation of access. (3) a zoning approach. and (4) limits on party size.

An investigation of visitor perception of wilderness recreation carrying capacity was conducted by Stankey (1973) in four wildernesses – the Bob Marshall in Montana, the Bridger in Wyoming, the High Uintas in Utah, and the Boundary Waters Canoe Area (BWCA) in Minnesota. His findings indicated that visitor's beliefs about wilderness and use type would affect visitor attitudes toward use control. For example, those persons whose concepts most closely coincided with the Wilderness Act, a group he called "strong purists", tended to be more favorable to the concept of use controls; horse riders were more opposed than hikers to the elimination of trails; motor boaters more opposed than canoeists to blocking off access roads to wilderness. Among direct rationing techniques, he reported the mail reservation system was the most acceptable approach while campsite assignment approach was the least supported one. User attitudes toward zoning were divided clearly between the study areas. In the BWCA, 60 percent of the responses agreed with the concept of separating travel methods; in the western

areas, only 25 percent agreed. Motor boaters and horse riders were more opposed than canoeists and hikers to a limit on party size. The study conducted by Roggenbuck et al. (1982) in the Southern Appalachians had similar findings to Stankey's (1973).

By asking visitors to two Southern California wilderness areas their opinions about rationing, Stankey (1979) found no significant difference in support for this program between those who got permits and those who didn't. Fazio and Gilbert (1974) had the same result in their study of Rocky Mountain National Park. Although most users support a rationing program, those who fail to obtain a permit might express anger, dismay, and frustration. Stankey (1979) reported nearly one-quarter of those refused permits had such feelings. Lack of information about this program was the major complaint. Thus, provision of appropriate information about the rationing program in advance of visitors' trips may be an important task for managers.

Shelby, et al. (1982) investigated the preferences of backpackers and river runners for allocation techniques in Oregon. They found that both pricing and reservation approaches were most favored by respondents. They also found that significant differences in preferences existed among three other alternatives (e.g., lottery, queuing, and merit). For instance, the merit approach was more favored by backpackers than by river runners.

Schreyer, et al. (1984) conducted a national survey of river recreationists to study the effects of past experience on recreation behavior. They presented a concept refered to as Experience Use History (EUH) which is defined as the amount

and extent of participation by the individual in recreation pursuits. In their study of user perceptions of use conflict and management orientation, they found that users with higher EUH, "veterans", would be more likely to perceive conflict with different types of use than those with lower EUH, who ranked as "novices". Veterans tended to define intensive management as more desirable than novices did.

In Lucas's (1985) investigation of the influence of visitor experience on wilderness recreation trends in the Bob Marshall Wilderness Complex, he suggested that some type of zoning or identification of primary horse use zones might be worth consideration by managers. This zoning approach can provide co-existence of both travel methods and avoid conflict between them.

Because increasing recreational use, if uncontrolled, will jeopardize the mandate of the Wilderness Act, regulation may play an important role in recreation management. However, the appropriateness of recreation regulations depends largely on the balance between the benefits and costs of a specific regulation and alternative, non-regulatory management actions for solving a particular problem. Lucas (1982) has presented an approach to analyzing such costs and benefits.

There are several types of regulation benefits. Lucas (1983) stated that eliminating some freedoms can create other, perhaps more valuable, freedoms. For example, removing motor boaters' freedom to operate in swimming areas greatly increases swimmers' freedom to swim safely. Regulations also can avoid the tragedy of the commons described by Hardin (1968), that is, overuse of some recreation resource will lead to a loss for all the public.

Although visitors accept regulations, this does not mean they prefer them. In many cases, conscientious visitors accept restrictions because they see them as the lesser of two evils (Lucas 1983). In addition, visitor acceptance of regulations can be a false indicator of successful visitor management because those who are tolerant of regulations may displace those who are not. Thus, the managers should care about visitor attitudes toward regulations at all times to avoid what Behan (1974) called "police state wilderness" referring to the protest of regulations.

Lucas (1980) found that two-thirds of the sampled campers in nine wildernesses of Idaho and Montana opposed the idea of a regulation prohibiting wood fires, and horse users rejected by 3 to 1 a possible requirement of carrying in all stock feed. Although most wilderness users reacted more favorably to non-regulatory actions, several surveys of wilderness management practices show more reliance on regulations than on non-regulatory alternatives (Washburne and Cole 1983, Fish and Bury 1981). Because limited knowledge of recreation regulations is common (Lucas 1983), the managers also should pay attention to informing visitors about regulations through an effective approach before any violation occurs.

A key management objective for wilderness is the perpetuation of natural forest ecosystems (Habeck and Mutch 1973). Lightning fire is one of the principal natural forces affecting ecosystems in wilderness areas. In light of this, the Forest Service has initiated new policies regarding fire suppression in wilderness (Stankey 1976). What people believe about wilderness fire may affect their attitudes toward fire management policies and in turn support or oppose them. Worf (1985)

emphasizes that public awareness is important in gaining support for the use of fire in wilderness.

Stankey (1976) investigated the beliefs and attitudes of wilderness users toward modified fire suppression in wilderness. He found that most of the users favored supression and most users revealed a fairly low level of understanding about the role of fire in wilderness. A strong association between higher knowledge scores and support for liberalized suppression indicated that education and communication programs are important parts of fire management.

McCool and Stankey (1986) compared visitor beliefs and attitudes in 1971 and 1984. They found visitors in 1984 more knowledgeable about natural fire effects than those in 1971. The 1984 visitors were more supportive of managing naturally occurring fires than those in 1971. In both years, the same strong association between knowledge level about fire and positive attitude toward fire policies was found. However, they found that those who favored manager-ignited fires tended to cite reasons not dependent on wilderness values. This finding suggest the need for more public discussion of the rationale and philosophy of manager-ignited fires.

Chapter 3

Methods

3.1. Source of data

The source of data used in this study is the visitor survey of 1982, conducted in the Bob Marshall Wilderness Complex by the Intermountain Forest and Range Experiment Station, U. S. D. A. Forest Service. Dr. Robert Lucas led this research and has provided a general analysis on the data (Lucas 1985). This study will specifically look at visitor attitudes toward use control, regulations, and some wilderness management policies.

The study population included all adult visitors (defined as anyone sixteen years old or older) who entered the Bob Marshall Wilderness Complex in Summer and Fall of 1982. The basic method of data collection was personal contact with visitors, supplemented by temporary special registration stations.

Field workers contacted visitors at thirty four trailheads which managers estimated to average at least five visitors per week. They briefly explained the study and asked the names and addresses of visitors. In addition, special portable trail registers were used at fourteen trailheads estimated to average at least one but less than five visitors per week. This approach also explained the study briefly and asked visitors to register as individuals, not just the group leaders, and to provide their names and addresses. Sample visitors were selected randomly from

both approaches. The data was gathered from late June to late October in 1982. Sampled visitors were mailed a questionnaire and a self-addressed, stamped return envelope. Two follow-up letters with a questionnaire for non-respondents were used. An 82 percent response rate was achieved, (785 from a sample of 972 visitors), (Lucas 1985).

3.2. Defining visitor attitudes

Question No. 33 of the questionnaire (appendix A) used in this study included 31 statements. Visitors were asked to respond to each of those statements in terms of how desirable they thought it would be. Fourteen statements were selected and grouped into three categories according to the content of each statement related to this study (Lucas 1980). These three categories were: 1) Use control, 2) Wilderness regulations, and 3) Wilderness policies.

1. Use control.

    a. statement O: restricting the number of visitors to an area if it is being used beyond capacity.

    b. statement AA: issue trip permits so visitors could only camp each night in the assigned area.

    c. statement S: limiting the size of parties to 12 people.

    d. statement L: closing some areas to use by horse parties.

2. Wilderness regulations.

    a. statement M: prohibiting wood fires where dead wood is scarce (requiring use of gas stoves).

    b. statement p: eliminating grazing by visitors' horses (require carrying horse feed).

    c. statement Q: requiring all visitors to register when entering.

    d. statement T: prohibiting camping within 200 feet of lakes or streams.

    e. statement CC: allow visitors to catch fish to eat in the wilderness but not to bring out.

    f. statement DD: packing unburnable garbage back out of the wilderness.

3. Wilderness policies.

    a. statement J: natural forest fires started by lightning.

    b. statement R: a natural fishery - no stocking, and barren lakes left barren.

    c. statement X: use of chain saws by the administrators to clear trails of trees.

    d. statement EE: rangers or patrolmen in the backcountry.

3.3. Independent variables

Analyses were conducted by using these three categories and the independent variables relative to individual hypothesis.

1. To test (H 1), the independent variable was:

    * Question 19, ask visitors to indicate the importance of each expected outcome.

2. To test (H 2), the independent variables was:

    * Question 34, ask visitors to indicate the importance or value of wilderness.

3. To test (H 3), the independent variables were:

    * Question 9, 10, and 18, ask visitors about their past experiences of wilderness trips.

    * Question 40, ask visitors about their education levels.

    * Question 39, ask visitors where they live now, and before age 18.

4. To test (H 4), the independent variable was:

    * Question 1, ask visitors how they travelled in the wilderness on this trip.

5. To test (H 5), the independent variable was:

    * Question 5, ask visitors whether they were day-users or campers.

6. To test (H 6), the independent variable was:

    * Question 20, ask visitors to indicate the low points that dissatisfied them.

7. To test (H 7), the independent variables were:

* Question 10, ask visitors about the quality of the areas they visited.

* Question 15, ask visitors whether they rejected any trailhead and chose another one.

* Question 23, ask visitors how often they camped in the first campsite they chose.

* Question 24, ask visitors whether they passed up a campsite because of bad condition.

* Question 27, ask visitors whether they had a hard time finding an unoccupied campsite.

* Question 29, ask visitors how they felt about other people they encountered on their trips.

* Question 31, ask visitors whether they perceived a crowding problem.

* Question 32, ask visitors whether they perceived bio-physical impact.

3.4. Statistical methods

Statistical methods used in this study included frequency analysis and the Chi-square test. The SPSSx computer package was used in all data analyses in this study.

The choice of a statistical level of significance, that is, establishing the probability of rejecting the null hypothesis when in fact it is true, needs some discussion here. Most researchers select arbitrarily the level of .05, .01 or .001 as the statistical level of significance regardless of the nature and type of problem (Skipper, et al. 1970). In testing research hypotheses, two types of errors are of concern. They are type I errors, which mean to reject the null hypothesis when it

is true, and type II errors, which mean to accept the null hypothesis when it is actually false. Because the two types of errors are inversely related to each other, we cannot minimize both of them without increasing the sample size. Thus, the nature of the problem under study dictates which type of error is to be minimized. For instance, a higher level (say, .20) would be justified if we feel it is more desirable to risk rejection of the null hypothesis when it is true.

The Chi-square test is frequently used to test goodness of fit or independence between variables in social and behavioral science research. A significant Chi-square value, at best, permits one to say that probably there is some dependence between variables in the population, but the extent of dependence may be virtually zero regardless of the significance level. Whether a linear relationship exists between variables depends on the pattern of concentration of subjects lies along a diagonal of the table. Base on these two concerns about the Chi-square test, all Chi-square values and their related p-values will be listed and discussed..

Chapter 4

Results

4.1. Visitor characteristics

Visitors from Montana dominated the visitor population in this survey. More than 60 percent were from Montana, including 54 percent from northwestern Montana. Almost 50 percent of the visitors were in the 25 to 44 age group, about 20 percent of the visitors were in the 15 to 24 and the over 45 age groups, respectively. Most visitors were males, only about 10 percent of the visitors were females (Lucas 1985).

Education levels of the visitors were high, as many previous studies have reported. More than 70 percent of the visitors received college or university education (table 1), less than 3 percent had less than 10 years of education. About 20 percent of the respondents were under 25 years of age, and many were currently students, so that their current education level is usually lower than it would be when they were 25 years old (Lucas 1985).

Most of the visitors to the Bob Marshall Wilderness Complex were from small- to medium-sized urban areas. About 65 percent were currently from urban areas, only about 7 percent were from large cities (over 1 million population). This indicates that most visitors were from Montana, which has no large cities. There was not much difference in percentage between current residence and childhood

residence (table 2).

Having previous experience was a common characteristic of visitors to the BMWC, about 80 percent of the visitors have visited some wilderness before their BMWC trips. However, nearly 60 percent of the respondents reported that they had not visited the BMWC before. Most of those with some previous wilderness exprience had only 1 to 2 wilderness trips, but about 40 percent of those with BMWC experience had over 6 BMWC trips (table 3). This indicated that visitors repeatedly visited the BMWC.

Table 1. Visitor's Education Levels, in Percent.

Level	n	%
Elementary	19	2.6
High School	191	26.0
College	317	43.1
Graduate	208	28.3
Total	735	100.0

Table 2. Visitor Residence Types, in Percent.

Type	Current		Before Age 18	
	n	%	n	%
On the Farm	98	13.8	154	22.1
Rural or small town (under 1,000 population)	102	14.3	81	11.6
Town (1,000 - 5,000 population)	101	14.2	95	13.6
Small city (5,000 - 50,000 population)	225	31.6	178	25.5
Medium city (50,000 - 1 million population)	136	19.1	122	17.5
Large city (over 1 million population)	50	7.0	68	9.7
Total	712	100.0	698	100.0

Table 3. Visitor Wilderness Experience, in Percent.

Number of Visits	Any Wilderness		BMWC	
	n	%	n	%
0	138	18.8	353	59.5
1 - 2	329	45.3	73	12.4
3 - 5	142	19.6	67	11.3
Over 6	118	16.3	100	16.8
Total	727	100.0	593	100.0

4.2. Visitor beliefs about the BMWC

Respondents rated the importance of 10 main reasons for choosing to visit the BMWC instead of some other kind of recreation area. These 10 main reasons, referred to as visitor's social-psychological outcomes, were ranked by a 2-step scoring procedure used by Witter, et al.(1979) in their study of Missouri trout park anglers.

Visitors in this study felt it was "very important" that the BMWC afforded them an opportunity to enjoy scenic beauty, to relax, to escape civilization, to avoid mechanized recreation, and to experience solitude. "Somewhat important" reasons to visitors were to exercise and get in shape, to fish, to face the challenge of wild country, and to develop backcountry skills. To hunt was the only "not important" reason to the respondents. This reflects Lucas's (1985) findings that there appears to be a slight shift from the more consumptive uses (hunting and fishing) to the more contemplative activities (photography, nature study, hiking etc.). Among those reasons rated "very important", to enjoy scenic beauty was in first place while to experience solitude was the last one in the rank order of this category (table 4).

Visitors rated their beliefs about wilderness in terms of importance or value. More than 90 percent said wilderness was at least "very important" to them personally while only 1 percent said that wilderness was "not very important". From this result, it shows that visitors have a very positive perception concerning wilderness (table 5).

Table 4. Importance of visitors' reasons to the BMWC, in Percent.

Reasons	Very important	Somewhat important	Not important	Mean	n
Very important					
Scenery	84.8	14.3	1	1.84	728
Relaxation	68.2	27.2	4.6	1.64	720
Escape civilization	69.3	23.4	7.3	1.62	709
Avoid mechanical rec.	59.4	21.6	12.9	1.5	700
Solitude	50.9	33.5	15.6	1.35	687
Somewhat important					
Exercise	30.5	46.4	23.2	1.07	686
Fishing	34.3	33.5	32.2	1.03	690
Challenge	30.9	41.2	27.8	1.02	679
Develop skills	20.1	48	31.9	0.88	673
Not important					
Hunting	24.8	11.5	63.7	0.61	641

Table 5. Visitor perceptions of the importance of Wilderness

	n	%
Extremely important	538	73.4
Very important	145	19.8
Fairly important	47	6.4
Not very important	2	0.3
Not at all important	1	0.1
Total	733	100

4.3. Visitor attitudes toward use control

Similar to the results of previous studies, most visitors supported the approach of "restricting the number of visitors to an area if it is being used beyond capacity", while 13 percent said it was undesirable. Lucas (1985) criticized the wording of the statement as hard to disagree with because the contention would be over what visitors define as "beyond capacity".

Visitors strongly opposed the approach of "issuing permit to camp in the assigned campsite each night". Less than 5 percent of the respondents said it was desirable but about 10 percent agreed with this approach only in high use areas. This may indicate that most visitors recognize the freedom of choice as one of the values of wilderness trips. "Limits on party size to 12 people" was quite well supported with only about 20 percent saying that it was undesirable.

"Closing some areas to use by horse parties" was favored by more than opposed it. More than one-third (34%) of the respondents said it was undesirable, this may be explained by 70 percent of horse users objected to it while 70 percent of the hikers favored it and the proportion between hikers and horse users is about 3 to 2. From this result, some kind of conflict between these two types of users can be predicted. (table 6).

4.4. Visitor attitudes toward wilderness regulations

The regulation of "prohibiting wood fires where dead wood is scarce (requiring use of gas stoves)" was favored by a little more than opposed it. However, if we include those who said it was desirable in high use areas (about 15%), we can say this regulation is quite well supported. Opposite to the finding of the former regulation, the regulation of "eliminating grazing by visitors' horses (require carrying horse feed)" was rejected by more visitors than favored it. However, about 22 percent said it was desirable in high use areas.

Nearly half of the respondents supported the regulation of "requiring all visitors to register when entering". The percentage of the respondents who said either "don't care" or "undesirable" is close. The regulation of "prohibiting camping within 200 feet of lakes or streams" was opposed by about 50 percent of the visitors. This regulation prehaps affects visitor's freedom of choice during their wilderness trips and their convenience of getting water or engaging in water-related activities such as fishing or swimming.

"Allowing visitors to catch fish to eat in the wilderness but not to bring out" was a desirable regulation for about 55 percent of the visitors. About one-fourth of the respondents said it was undesirable; perhaps this is related to the fact that about 60 percent of visitors were involved in fishing.

Nearly 90 percent of the respondents supported the regulation of "packing unburnable garbage back out of the wilderness" with only about 5 percent saying it was undesirable. This indicates that most visitors have accepted the concept of "pack it in, pack it out" for handling unburnable garbage. Those who said "don't

care" or "undesirable" about this regulation could be misinformed by the older recommended practice of burying garbage. (table 7).

4.5. Visitor attitudes toward wilderness policies

Natural fire policy that permits natural fire started by lightning to play its ecological role in the wilderness was favored by about 50 percent of the visitors to the BMWC. Although about one-third of the respondents said it was undesirable, it indicates that the more ecologically oriented view has gained strength (Lucas 1985). The policy of "a natural fishery - no stocking, and barren lakes left barren" had less support, only about one-third of the respondents said it was desirable. Again, nearly 60 percent of the visitors were engaged in fishing activity. To catch some fish may perhaps add more fun to their trip though it is not necessary to catch fish to eat.

A few more respondents supported than opposed the policy of "administrative use of chain saw to clear trails of trees". However, it may indicate that a modest shift toward a somewhat more purist, less convenience-oriented view seems to have occurred (Lucas 1985). "Wilderness rangers or patrolmen in the backcountry" was well accepted with only about 11 percent opposed. It is believable that most visitors are well-minded, which means they are not purposely destroyers, to visit the BMWC. It appears that most visitors see a ranger as a source of information and help than as an enforcer or policeman in the wilderness. (table 8).

Table 6. Visitor attitudes toward use control approaches, in Percent.

Approaches	Undesirable	Don't care	Desirable	Desirable in high used area
Limit use in over-used area	13.0	6.0	70.1	10.9
Permit for assigned campsite	77.8	7.7	4.9	9.6
Limit party size to 12 people	19.9	20.0	54.9	5.2
Close area for horse use	34.3	13.4	48.0	4.4

Table 7. General visitor attitudes toward wilderness regulations, in Percent.

Regulations	Undesirable	Don't care	Desirable	Desirable in high used area
No woodfire if deadwood is scarce	36.5	11.2	37.4	14.8
No horse grazing	32.7	18.5	27.0	21.8
Require registration	21.1	24.8	49.9	4.2
No camping within 200 feet of waters	49.8	9.4	27.6	13.1
Catch fish to eat but not to bring out	25.6	15.2	55.3	4.0
Pack unburnable garbage out	5.6	3.0	89.0	2.4

Table 8. General visitor attitudes toward wilderness policies, in Percent.

Policies	Undesirable	Don't care	Desirable	Desirable in high used area
Natural fire	29.8	18.5	49.6	2.0
Natural fishery	47.1	23.1	28.3	1.5
Administrative use of chain saw	31.0	22.5	36.3	10.2
Ranger patrolling	11.6	29.2	49.7	9.5

4.6. Tests of study hypotheses

Seven null hypotheses were tested to investigate the relationships between visitor attitudes toward use control approaches, wilderness regulations, and wilderness policies and various independent variables.

4.6.1. Test of Hypothesis 1

> Hypothesis 1 - Attitudes of visitors to the BMWC toward use control, wilderness regulations, and wilderness management policies are not different between those who perceive consumptive reasons (fishing and hunting) as "very important" or "somewhat important" and those who don't.

Those who rated fishing and hunting as at least "somewhat important" reasons for choosing to visit the BMWC were referred to as having consumptive beliefs about wilderness, while those who didn't were referred to as having non-consumptive beliefs about wilderness. Chi-square tests were used to test the relationships between independent variables - visitor beliefs and the dependent variables - visitor attitudes toward use control, wilderness regulations, and wilderness management policies.

The result indicated that only the regulation of "pack unburnable garbage back out of the wilderness" (sign. level .2001), and the management policies of both "natural fires started by lightning" (sign. level .3261) and "administrative use of chain saw to clear trails of trees" (sign. level .1510) supported the null hypothesis at .05 significance level.

More visitors with non-consumptive beliefs about wilderness supported use control approaches than those with consumptive beliefs did. For instance, 84

percent of the former supported "rationing visitors in an area if it is being used beyond capacity", while only 66 percent of the latter supported it; more than 80 percent of those with consumptive beliefs said "permits for assigned campsite" was undesirable, while 68 percent of those with non-consumptive beliefs did the same; "limit party size to 12 people" was supported more by those with non-consumptive beliefs (62.2%) than those with consumptive beliefs (53.2%); "close some areas to use by horse parties" was also supported by those with non-consumptive beliefs (59.1%) more than those with consumptive beliefs (43.7%).

Those with non-consumptive beliefs about wilderness supported wilderness regulations more than did those with consumptive beliefs. These regulations included: 1) prohibiting wood fires where dead wood is scarce, 2) require carrying horse feed, 3) requiring all visitors to register when entering, 4) prohibit camping within 200 feet of lakes or streams, 5) allow visitors to catch fish to eat but not bring them out.

The policies of "natural fishery" and "rangers in the backcountry" were supported by more visitors with non-consumptive beliefs about wilderness than those with consumptive beliefs.

In general, the results of this test indicate the attitudes of visitors with non-consumptive beliefs were more supportive of use control, wilderness regulations, and wilderness policies than the attitudes of those with consumptive beliefs. Thus, this hypothesis was generally rejected at the .05 significance level. (table 9).

Table 9. Tests of Hypothesis 1. The relationship between visitor beliefs and their attitudes.

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	sign. level
Limit use in over used area	14.7/5.8	6.7/3.8	66.5/84.0	12.1/6.4	18.12	0.0004
Permit for assigned campsite	80.9/68.2	6.4/12.1	4.5/7.0	8.2/12.7	11.97	0.0075
Limit party size to 12 people	22.9/10.3	19.0/23.7	53.2/62.2	4.9/3.8	13.05	0.0045
Close area for horse use	39.4/20.8	12.5/15.7	43.7/59.1	4.5/4.4	19.34	0.0002
Wilderness regulations						
No woodfire if deadwood is scarce	40.3/22.8	11.6/10.1	32.6/53.2	15.5/13.9	24.49	0.0000
No horse grazing	36.3/22.9	18.4/18.5	22.7/40.8	22.5/17.8	22.55	0.0001
Require registration	24.4/8.9	23.8/27.8	48.1/57.6	3.7/5.7	18.32	0.0004
No camping within 200 ft. of waters	54.9/35.4	8.8/11.4	23.3/39.9	13.1/3.3	22.36	0.0001
Catch fish to eat but not to bring out	29.2/14.6	13.8/21.0	52.6/63.1	4.5/1.3	19.79	0.0002
Pack unburnable garbage out	5.9/4.4	2.6/4.4	88.5/90.5	3.0/0.6	4.64	0.2001
Wilderness policies						
Natural fire	32.1/25.3	19.2/18.0	46.9/54.0	1.8/2.7	3.46	0.3261
Natural fishery	54.9/21.9	18.0/42.6	25.6/34.2	1.5/1.3	61.51	0.0000
Administrative use of chain saw	31.2/31.4	21.7/24.4	37.9/30.1	9.2/14.1	5.31	0.1510
Ranger patrolling	13.5/4.5	29.3/29.9	46.7/58.0	10.6/7.6	12.91	0.0048

1. Numbers in the left hand side represent the percentage of those visitors who had consumptive beliefs. Numbers in the right hand side represent the percentages of those who had non-consumptive beliefs.
2. Degree of freedom = 3.

4.6.2. Test of Hypothesis 2

> Hypothesis 2 - Visitor attitudes toward use control, wilderness regulations, and wilderness management policies are not different between visitors who perceive different degrees of the importance of wilderness.

How visitors evaluated the importance of wilderness were recoded into two groups - "very important" and "fairly important" instead of its original five levels(appendix A), because from table 5 we knew more than 90 percent of the respondents said that wilderness was at least "very important" to them; additionally, this permitted reducing the number of degrees of freedom from 12 to 3.

The approach of "issuing permit for assigned campsite" (sign. level .5214) was the only one among four use control approaches that supported the null hypothesis at the .05 significance level. The approach of "limits on party size to 12 people" could be considered as supporting the null hypothesis at the .05 significance level, because its p-value was .0540 which was a little higher than the .05 significance level. However, this little difference between .0540 and .0500 can be neglected, thus, it would be better to conclude that the null hypothesis was rejected at the .0540 significance level.

To test whether any difference exists in visitor attitudes toward wilderness regulations, Chi-square tests were used. The results showed that visitor attitudes toward four regulations including "prohibiting wood fires where dead wood is scarce" (sign. level .0629), "require registration when entering wilderness areas" (sign. level .1351), "prohibiting camping within 200 feet of lakes or streams"

(sign.level .0606), and "allow to catch fish to eat in wilderness but not to bring out" (sign. level .2287) supported the null hypothesis at the .05 significance level.

According to the results of testing visitor attitudes toward four wilderness policies with their perceptions of importance of wilderness, it showed that the null hypothesis was supported at the .05 significance level.

In general, visitor attitudes toward use control were somewhat related to their perceptions of the importance of wilderness, but their attitudes toward wilderness regulations and policies had a weak association with their perceptions of the importance of wilderness (table 10).

Table 10. Tests of Hypothesis 2. The relationship between visitor perceptions of the importance of wilderness and their attitudes.

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used are	Chi-square	Sign. level
Limit use in over used area	12.3/24.5	5.5/14.3	71.7/44.9	10.5/16.3	17.18	0.0007
Permit for assigned campsite	77.8/76.0	7.4/12.0	5.2/2.0	9.6/10.0	2.25	0.5214
Limit party size to 12 people	19.5/26.0	19.2/32.0	55.9/38.0	5.3/4.0	7.64	0.0540
Close area for horse use	34.5/32.0	11.9/34.0	49.3/28.0	4.0/6.0	21.7	0.0001
Wilderness regulations						
No woodfire if deadwood is scarce	35.9/44.0	10.7/20.0	38.5/24.0	14.9/12.0	7.3	0.0629
No horse grazing	32.1/42.0	17.7/30.0	27.9/16.0	22.3/12.0	9.91	0.0193
Require registration	20.8/26.0	24.0/34.0	51.0/34.0	4.1/6.0	5.56	0.1351
No camping within 200 ft. of waters	48.7/68.0	9.6/8.0	28.3/18.0	13.4/6.0	7.38	0.0606
Catch fish to eat but not bring out	24.8/36.0	14.9/18.0	56.3/42.0	4.0/4.0	4.32	0.2287
Pack unburnable garbage out	4.8/16.0	2.5/10.0	90.2/72.0	2.5/2.0	20.92	0.0001
Wilderness policies						
Natural fire	30.0/28.3	18.0/23.9	50.0/45.7	2.0/2.2	1.04	0.7924
Natural fishery	47.1/47.9	22.8/27.1	28.6/22.9	1.5/2.1	0.98	0.8055
Administrative use of chain saw	31.9/18.8	22.5/25.0	35.2/50.0	10.5/6.3	6.15	0.1045
Ranger patrolling	11.6/12.0	28.8/36.0	49.8/48.0	9.8/4.0	2.55	0.4668

1. Numbers in the left hand side represent the percentages of those visitors who evaluate wilderness as at least very important.
   Numbers in the right hand side represent the percentages of those who evaluate wilderness as fairly important.
2. Degree of freedom = 3.

4.6.3. Test of Hypothesis 3

> Hypothesis 3 - Visitor attitudes toward use control, wilderness regulations, and wilderness policies do not differ among visitors with different backgrounds (e.g., education level, residence, and past experience of wilderness trips).

To test this hypothesis, the independent variables were recoded as follow: years of education was recoded into four levels which included elementary (1 to 9 years), high school (10 to 12 years), university (13 to 16 years), and graduate (over 16 years). Residence was recoded into three groups which included rural (population less than 50,000),town (50,000 to 1 million population), and city (over 1 million population). Visitor's past experience was recoded into three groups which included group 1 (1 to 2 times), group 2 (3 to 5 times), and group 3 (over 5 times).

Chi-square tests were used to test the relationships between visitor education levels and their attitudes. The results indicated that visitor attitudes toward the use control approach of "limiting number of visitors to an area if it is being used beyond capacity" (sign. level .1003) was the only one that supported the null hypothesis at the .05 significance level.

Two regulations including "require registration when entering wilderness area" (sign. level .3027) and "pack unburnable garbage back out of wilderness" (sign. level .1821) were found to support the null hypothesis at the .05 significance level. Visitor attitudes toward the wilderness policies in this study do not differ with their education levels except their attitudes toward the policy of "natural fires started by lightning" (sign. level .0018) (table 11). For instance, visitors with higher education levels support the natural fire policy.

Table 11. Tests of Hypothesis 3. The relationship between visitor education levels and their attitudes.

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	E 21.1	E 10.5	E 63.2	E 5.3	14.67	0.1003
	H 14.2	H 10.0	H 67.9	H 7.9		
	C 12.1	C 5.4	C 69.3	C 13.1		
	G 12.6	G 2.9	G 73.8	G 10.7		
Permit for assigned campsite	E 84.2	E 10.5	E 5.3	E 0.0	18.98	0.0254
	H 84.2	H 8.4	H 2.6	H 4.7		
	C 78.1	C 7.0	C 5.4	C 9.5		
	G 70.7	G 7.8	G 6.3	G 15.1		
Limit party size to 12 people	E 33.3	E 16.7	E 50.0	E 0.0	17.95	0.0357
	H 26.8	H 18.4	H 50.5	H 4.2		
	C 16.8	C 23.1	C 53.2	C 7.0		
	G 17.1	G 17.1	G 62.0	G 3.9		
Close area for horse use	E 42.1	E 21.1	E 31.6	E 5.3	45.17	0.0000
	H 49.7	H 15.3	H 32.3	H 2.6		
	C 32.0	C 13.0	C 49.4	C 5.7		
	G 23.1	G 11.5	G 61.5	G 3.8		
Wilderness policies						
Natural fire	E 64.7	E 11.8	E 23.5	E 0.0	26.3	0.0018
	H 34.7	H 20.5	H 41.5	H 3.4		
	C 29.3	C 20.3	C 48.7	C 1.7		
	G 23.2	G 14.4	G 60.8	G 1.5		
Natural fishery	E 58.8	E 17.6	E 23.5	E 0.0	10.32	0.3248
	H 52.2	H 24.2	H 22.0	H 1.6		
	C 46.6	C 24.3	C 27.8	C 1.3		
	G 42.1	G 20.8	G 35.1	G 2.0		
Administrative use of chain saw	E 26.3	E 26.3	E 47.4	E 0.0	9.39	0.4022
	H 32.8	H 20.1	H 38.6	H 8.5		
	C 32.8	C 24.5	C 32.8	C 9.9		
	G 27.2	G 21.4	G 38.3	G 13.1		
Ranger patrolling	E 15.0	E 20.0	E 60.0	E 5.0	12.4	0.1918
	H 13.0	H 34.9	H 46.4	H 5.7		
	C 11.1	C 29.4	C 47.8	C 11.7		
	G 10.7	G 24.3	G 54.9	G 10.2		

Wilderness regulations	Undesirable	Don't care	Desirable	Desirable in high used aree	Chi-square	Sign. level
No woodfire if deadwood is scarce	E 63.2	E 21.1	E 5.3	E 10.5	54.2	0.0000
	H 50.8	H 13.1	H 24.6	H 11.5		
	C 33.9	C 11.7	C 38.0	C 16.5		
	G 24.6	G 7.9	G 51.7	G 15.8		
No horse grazing	E 63.2	E 21.1	E 5.3	E 10.5	53.69	0.0000
	H 47.6	H 17.5	H 20.1	H 14.8		
	C 29.5	C 19.7	C 24.8	C 26.0		
	G 21.3	G 17.4	G 38.6	G 22.7		
Require registration	E 15.8	E 26.3	E 52.6	E 5.3	10.62	0.3027
	H 23.6	H 26.7	H 45.5	H 4.2		
	C 21.1	C 27.4	C 46.7	C 4.7		
	G 19.2	G 18.8	G 58.7	G 3.4		
No camping within 200 ft. of waters	E 57.9	E 5.3	E 26.3	E 10.5	30.14	0.0004
	H 58.3	H 10.9	H 21.9	H 8.9		
	C 50.6	C 11.1	C 23.6	C 14.6		
	G 39.8	G 5.8	G 39.3	G 15.0		
Catch fish to eat but not to bring out	E 36.8	E 26.3	E 36.8	E 0.0	24.1	0.0041
	H 28.9	H 21.1	H 47.4	H 2.6		
	C 27.4	C 13.6	C 54.9	C 4.1		
	G 18.5	G 11.2	G 64.9	G 5.4		
Pack unburnable garbage out	E 10.5	E 10.5	E 73.7	E 5.3	12.59	0.1821
	H 6.8	H 3.6	H 85.9	H 3.6		
	C 5.3	C 2.5	C 91.2	C 0.9		
	G 4.3	G 2.4	G 89.9	G 3.4		

1. E: elementary, H: high school, C: college or university, G: graduate.
2. Degree of freedom = 9

More than 70 percent of the visitors were from areas where the population is less than 50,000 people while only about 7 percent were from large cities with over 1 million population. Chi-square tests were used to test the hypothesis of whether visitor's current residence affects their attitudes toward use control approaches, wilderness regulations and wilderness policies.

The results indicate that those from rural areas or small towns (population less than 50,000 people) give less support to use control approaches including "issuing permits for assigned campsites", "limit party size to 12 people", and "close some areas to use by horse parties" than those from medium or large cities. Although visitor attitudes toward the approach of "limit use if an area is being used beyond capacity" (sign. level .0922) supported the null hypothesis at the .05 significance level, the percentages encourage us to consider rejecting the null hypothesis at the .0922 significance level.

Visitor attitudes toward two regulations including "prohibit camping within 200 feet of lakes or streams" (sign. level .1484), and "pack unburnable garbage back out of wilderness" (sign. level .1696) were not different at the .05 significance level because of different residences. Visitors from medium or large cities give more support to the regulations of "prohibiting wood fires if dead wood is scarce", "prohibiting horse grazing", "require registration when entering wilderness", and "allow catching fish to eat but not to bring out" than those from rural areas or small towns.

More visitors from medium or large cities favored the policy of "rangers working in the wilderness" than those from rural areas or small towns. It probably

means urban visitors need more help from rangers than do those from rural areas or small towns. However, fewer urban visitors supported the policy of "natural fires started by lightning" than those from rural areas or small towns, and more urban visitors said they "don't care" about this fire policy than rural visitors. No differences in attitudes toward the policies of "natural fishery" (sign. level .2433) and "administrative use of chain saw to clear trails of trees" (sign. level .4017) were found among different visitor residences at the .05 significance level (table 12).

Table 12. Tests of Hypothesis 3. The relationship between visitor current residence and their attitudes.

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	R 14.0 T 8.9 C 6.0	R 6.5 T 4.4 C 4.0	R 67.4 T 79.3 C 82.0	R 12.1 T 7.4 C 8.0	10.88	0.0922
Permit for assigned campsite	R 79.5 T 72.7 C 68.8	R 6.8 T 12.1 C 4.2	R 4.4 T 7.6 C 6.3	R 9.3 T 7.6 C 20.8	14.81	0.0218
Limit party size to 12 people	R 22.0 T 10.4 C 16.3	R 19.5 T 24.6 C 14.3	R 53.0 T 59.0 C 67.3	R 5.5 T 6.0 C 2.0	13.12	0.0412
Close area for horse use	R 38.9 T 18.4 C 24.5	R 12.4 T 16.2 C 10.2	R 44.7 T 61.8 C 57.1	R 4.0 T 3.7 C 8.2	25.48	0.0003
Wilderness policies						
Natural fire	R 31.1 T 23.4 C 31.3	R 18.0 T 15.3 C 35.4	R 49.5 T 57.3 C 29.2	R 1.4 T 4.0 C 4.2	19.9	0.0029
Natural fishery	R 47.6 T 45.0 C 42.0	R 23.7 T 26.0 C 16.0	R 27.8 T 26.0 C 40.0	R 1.0 T 3.1 C 2.0	7.93	0.2433
Administrative use of chain saw	R 30.5 T 32.8 C 28.6	R 21.1 T 24.6 C 32.7	R 37.5 T 32.1 C 34.7	R 10.9 T 10.4 C 4.1	6.2	0.4017
Ranger patrolling	R 11.1 T 13.9 C 9.8	R 31.4 T 19.7 C 33.3	R 47.4 T 59.9 C 43.1	R 10.1 T 6.6 C 13.7	12.4	0.0537

Wilderness regulations	Undesirable	Don't care	Desirable	Desirable in high used aree	Chi-square	Sign. level
No woodfire if deadwood is scarce	R 40.3	R 11.1	R 32.3	R 16.3	27.74	0.0001
	T 25.6	T 10.5	T 51.9	T 12.0		
	C 24.0	C 8.0	C 58.0	C 10.0		
No horse grazing	R 37.3	R 16.0	R 23.8	R 22.9	27.75	0.0001
	T 18.0	T 24.8	T 36.8	T 20.3		
	C 20.4	C 22.4	C 34.7	C 22.4		
Require registration	R 23.4	R 26.2	R 46.0	R 4.4	15.37	0.0176
	T 12.5	T 21.3	T 63.2	T 2.9		
	C 16.0	C 24.0	C 54.0	C 6.0		
No camping within 200 ft. of waters	R 51.8	R 9.4	R 25.2	R 13.6	9.48	0.1484
	T 40.4	T 12.5	T 33.1	T 14.0		
	C 51.0	C 4.1	C 34.7	C 10.2		
Catch fish to eat but not to bring out	R 28.9	R 15.9	R 50.9	R 4.4	21.35	0.0016
	T 14.7	T 12.5	T 69.1	T 3.7		
	C 18.4	C 8.2	C 71.4	C 2.0		
Pack unburnable garbage out	R 5.7	R 2.5	R 88.6	R 3.2	9.07	0.1696
	T 3.6	T 4.4	T 92.0	T 0.0		
	C 8.0	C 6.0	C 84.0	C 2.0		

1. R : Rural (under 50,000 population, T : Town (50,000 - 1 million population, C : City (over 1 million population)
2. Degree of freedom = 6

More than 80 percent of the visitors had wilderness experience though nearly 60 percent were visiting the BMWC for the first time. Chi-square tests were used to compare the attitude of those who had wilderness experience with that of those who didn't have wilderness experience.

The results indicated that the null hypothesis was supported at the .05 significance level by two use control approaches - "limit use in an area if it is being used beyond capacity" (sign. level .4740) and "issuing permits for assigned campsite" (sign. level .0668). Those who had wilderness experience supported the use control approaches more than those who didn't have wilderness experience.

Visitor attitudes toward three regulations - "prohibiting wood fires if dead wood is scarce" (sign.level .4810), "allow to catch fish to eat but not to bring out" (sign. level .6128), and "pack unburnable garbage back out of wilderness" (sign. level .3282) were found to support the null hypothesis at the .05 significance level.

Except for the policy of "natural fires started by lightning" (sign. level .0055), visitor attitudes toward the other three policies including "natural fishery" (sign. level .2754), "administrative use of chain saw to clear trails of trees" (sign. level .2946), and "rangers working in the wilderness" (sign. level .1778) were also found to support the null hypothesis at the .05 significance level (table 13).

Table 13. Tests of Hypothesis 3. The relationship between visitor's any wilderness experience and their attitudes.

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	13.6/10.9	5.1/8.0	70.2/71.5	11.1/9.5	2.51	0.4740
Permit for assigned campsite	77.6/80.0	7.8/6.7	4.1/8.1	10.4/5.2	7.17	0.0668
Limit party size to 12 people	19.9/19.4	17.9/29.1	56.6/48.5	5.6/3.0	9.65	0.0218
Close area for horse use	34.2/36.0	10.7/22.1	50.5/38.2	4.6/3.7	14.84	0.0020
Wilderness regulations						
No woodfire if deadwood is scarce	36.6/36.8	10.3/14.7	37.9/35.3	15.2/13.2	2.47	0.4810
No horse grazing	31.8/38.0	16.2/26.3	28.2/21.9	23.8/13.9	14.04	0.0028
Require registration	22.4/16.8	25.6/20.4	47.3/60.6	4.7/2.2	8.48	0.0371
No camping within 200 ft. of waters	48.0/57.7	9.0/10.2	28.2/26.3	14.8/5.8	9.27	0.0260
Catch fish to eat but not to bring out	24.9/29.2	14.7/16.1	56.1/51.8	4.3/2.9	1.81	0.6128
Pack unburnable garbage out	5.2/7.3	2.5/4.4	90.0/84.7	2.2/3.6	3.44	0.3282
Wilderness policies						
Natural fire	27.3/42.5	18.4/19.2	52.2/36.7	2.1/1.7	12.63	0.0055
Natural fishery	48.3/40.8	23.1/22.3	27.1/35.4	1.6/1.5	3.87	0.2754
Administrative use of chain saw	32.1/28.4	21.7/26.1	35.3/38.8	10.9/6.7	3.71	0.2946
Ranger patrolling	11.0/14.7	29.2/28.7	49.2/51.5	10.7/5.1	4.92	0.1778

1. Numbers in the left hand side represent the percentages of those who had any wilderness experience
   Numbers in the right hand side represent the percentages of those who didn't have any wilderness experience.
2. Degree of freedom = 3

Among those with wilderness experience, comparisons were made to test whether differences in attitudes exist because of different levels of wilderness experience. The results indicated that more experienced visitors would favor the use control approach of "closing some area to use by horse parties" and the regulations of "prohibiting horse grazing" and "require registration when entering wilderness". However, the less experienced visitors would favor the policy of "administrative use of chain saw to clear trails of trees" (table 14).

The differences in visitor attitudes among different levels of experience would remind managers to pay more attention to those visitors who have less experience. Because people's attitudes toward some object are influenced partly by their learned experience, the managers should help those less-experienced visitors learn gradually about wilderness conditions from the easier to the tougher.

Table 14. Tests of Hypothesis 3. The relationship between levels of visitor's any wilderness experience and their attitudes.

Use control approaches		Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	G1	10.9	7.2	72.3	9.6	6.38	0.3819
	G2	14.9	5.6	67.1	12.4		
	G3	16.9	4.4	66.9	11.8		
Permit for assigned campsite	G1	78.1	8	5.1	8.8	9.35	0.1550
	G2	82.9	3.7	3	10.4		
	G3	73.5	10.3	2.9	13.2		
Limit party size to 12 people	G1	18.6	22.8	53.3	5.3	10.06	0.1220
	G2	25.9	14.8	54.3	4.9		
	G3	17.0	16.3	59.3	7.4		
Close area for horse use	G1	35.5	17	43.2	4.2	17.67	0.0071
	G2	35.4	9.8	51.2	3.7		
	G3	27.7	7.3	60.6	4.4		
Wilderness policies							
Natural fire	G1	32.0	19.7	46.6	1.7	10.80	0.0947
	G2	24.7	21.5	50.6	3.2		
	G3	25.8	12.5	60.2	1.6		
Natural fishery	G1	47.0	22.6	29.6	0.8	7.37	0.2880
	G2	50.6	21.9	24.4	3.1		
	G3	43.6	25.6	30.1	0.8		
Administrative use of chain saw	G1	27.2	21.9	41.1	9.9	14.63	0.0233
	G2	33.7	20.2	36.8	9.2		
	G3	37.8	25.2	23.7	13.3		
Ranger patrolling	G1	12.4	31.1	48.7	7.9	10.37	0.1099
	G2	11.0	29.3	51.8	7.9		
	G3	09.6	24.4	49.6	16.3		

Wilderness regulations		Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
No woodfire if deadwood is scarce	G1	37.9	11.7	36.1	14.3	5.35	0.4996
	G2	37.4	9.8	36.2	16.6		
	G3	29.9	9	44.8	16.4		
No horse grazing	G1	33.2	24.7	21.2	21	30.86	0.0000
	G2	33.7	9.8	31.3	25.2		
	G3	26.5	12.5	37.5	23.5		
Require registration	G1	18.2	22.6	56.6	2.6	20.92	0.0019
	G2	23.3	29.4	41.1	6.1		
	G3	26.3	26.3	40.1	7.3		
No camping within 200 ft. of waters	G1	52.5	9.2	26.6	11.6	11.93	0.0636
	G2	50.3	11.2	23.6	14.9		
	G3	41.2	5.9	34.6	18.4		
Catch fish to eat but not to bring out	G1	22.1	14.7	60.3	2.9	9.32	0.1562
	G2	28.7	15.9	53	2.4		
	G3	30.1	13.5	50.4	6		
Pack unburnable garbage out	G1	7.4	2.4	88.2	2.1	8.69	0.1917
	G2	4.3	4.3	89	2.4		
	G3	2.9	0.7	93.4	2.9		

1. G1: 1 - 2 times of any previous wilderness experience
   G2: 3 - 5 times of any previous wilderness experience
   G3: over 6 times of any previous wilderness experience
2. Degree of freedom = 6

Those visitors without BMWC experience whose attitudes were more positive toward use control approaches including "limit use to an area if it is being used beyond capacity", "permits for assigned campsites" and "closing some area to use by horse parties" than those with BMWC experience. The same situation was found for the attitudes toward regulations including "prohibiting wood fires if the dead wood is scarce", "prohibiting horse grazing" and "require registration when entering wilderness". No differences in attitudes toward wilderness policies were found between those with BMWC experience and those without at the .05 significance level. Perhaps those without BMWC experience had had some other wilderness experience before they came to the BMWC (table 15).

One other reason could be that most visitors were from Montana, who saw the BMWC as their own property, and felt that there should not be any limitations on their uses in the wilderness areas. On the contrary, visitors from other States might think they don't come here to experience bad conditions such as crowding, damaged vegetation or disappointing scenery. Thus, they would prefer some limitations on use instead of feeling dissatisfaction during their trips.

Table 15. Tests of Hypothesis 3. The relationship between visitor's BMWC experience and their attitudes

Use control approaches	undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	14.2/12.1	7.4/2.5	65.3/77.0	13.1/8.4	12.28	0.0065
Permit for assigned campsite	81.5/71.1	6.0/10.7	3.7/5.4	8.8/12.8	9.29	0.0256
Limit party size to 12 people	22.0/15.8	16.9/20.0	56 6/57.1	4.5/7.1	5.24	0.1548
Close area for horse use	39.0/26.4	12.1/10.3	44.1/58.7	4.8/4.5	13.24	0.0042
Wilderness regulations						
No woodfire if deadwood is scarce	43.3/27.0	10.0/10.8	31.1/47.7	15.7/14.5	21.1	0.0001
No horse grazing	35.4/26.3	14.7/19.2	24.9/32.5	24.9/22.1	8.89	0.0307
Require registration	24.2/19.3	29.3/20.2	41.7/56.0	4.8/4.5	12.46	0.0060
No camping within 200ft. of waters	51.1/43.0	9.4/9.5	25.9/31.0	13.6/16.5	4.17	0.2441
Catch fish to eat but not to bring out	26.9/22.6	14.0/16.5	53.7/58.4	5.4/2.5	5.15	0.1611
Pack unburnable garbage out	5.4/4.9	2.3/3.7	89.9/89.7	2.5/1.6	1.64	0.6504
Wilderness policies						
Natural fire	27.0/28.1	18.8/18.0	51.9/52.2	2.3/1.8	0.33	0.9535
Natural fishery	48.3/47.1	23.0/24.2	26.4/28.3	2.3/0.4	3.6	0.3078
Administrative use of chain saw	33.6/28.3	18.6/27.1	37.9/32.9	9.9/12.1	7.68	0.0532
Ranger patrolling	10.7/11.2	32.9/23.6	46.6/53.3	9.8/12.0	6.25	0.1001

1. Numbers in the left hand side represent the percentages of those who had BMWC experience
   Numbers in the right hand side represent the percentages of those who didn't have BMWC experience.
2. Degree of freedom = 3

Among those with BMWC experience, the results indicated that visitors with less experience supported the use control approach of "limit use to an area if it is being used beyond capacity" more than those with more experience. The regulation "prohibit camping within 200 feet of lakes or streams" was supported more by those with more experience than those with less experience. Those with less experience supported the policy of "administrative use of chain saws to clear trails of trees" more than those with more experience. In general, levels of experience didn't cause as much variation as whether the visitors had BMWC experience or not (table 16).

By comparing the variation in visitor attitudes between levels of any wilderness experience and levels of the BMWC experience, the results revealed that more variation existed among levels of any wilderness experience than it existed among levels of the BMWC experience. This probably matched the finding that 75 percent of the experienced visitors who indicated the quality of the BMWC was about the same.

In general, visitor attitudes toward use control, wilderness regulations and wilderness policies were more influenced by their education level and current residence than their past experiences. Thus, whether to reject or accept this hypothesis would depend on what independent variables we considered to use.

Table 16. Tests of Hypothesis 3. The relationship between levels of visitor's BMWC experience and their attitudes

Use control approaches		undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	G1	9.1	11.8	70.9	8.2	13.16	0.0406
	G2	15.7	7.8	61.8	14.7		
	G3	18.1	3.5	63.2	15.3		
Permit for assigned campsite	G1	78.0	8.3	6.4	7.3	9.69	0.1384
	G2	80.4	8.8	2	8.8		
	G3	84.8	2.1	3.4	9.7		
Limit party size to 12 people	G1	20.0	17.3	60	2.7	5.33	0.5024
	G2	20.4	19.4	56.3	3.9		
	G3	26.2	15.2	51.7	6.9		
Close area for horse use	G1	34.3	3.9	46.3	5.6	5.99	0.4243
	G2	35.9	14.6	43.7	5.8		
	G3	44.9	8.2	43.5	3.4		
Wilderness policies							
Natural fire	G1	29.1	23.3	43.7	3.9	9.4	0.1523
	G2	27.0	21	49	3		
	G3	26.4	13.6	59.3	0.7		
Natural fishery	G1	46.8	21.1	28.4	3.7	3.32	0.7682
	G2	47.6	23.3	26.2	2.9		
	G3	50.0	24.3	25	0.7		
Administrative use of chain saw	G1	25.5	18.2	40	16.4	14.37	0.0258
	G2	32.0	23.3	38.8	5.8		
	G3	40.7	14.5	37.2	1.6		
Ranger patrolling	G1	9.1	40.9	40.9	9.1	8.39	0.2112
	G2	10.8	34.3	47.1	7.8		
	G3	11.5	25	50.7	12.8		

Wilderness regulations	undesirable	Don't care	Desirable	desirable in high used area	Chi-square	Sign. level
No woodfire if deadwood is scarce	G1 43.1	7.3	35.8	13.8	11.39	0.0770
	G2 37.6	17.8	28.7	15.8		
	G3 47.6	6.9	28.3	17.2		
No horse grazing	G1 34.5	20	25.5	20	10.98	0.0891
	G2 27.7	13.9	29.7	28.7		
	G3 42.5	10.3	21.9	25.3		
Require registration	G1 18.2	32.7	45.5	3.6	12.37	0.0542
	G2 27.2	33	37.9	1.9		
	G3 28.8	22.6	44.4	8.2		
No camping within 200 ft. of waters	G1 59.1	8.2	20	12.7	16.51	0.0113
	G2 47.1	16.7	21.6	14.7		
	G3 48.6	4.9	33.3	13.2		
Catch fish to eat but not to bring out	G1 26.6	11.9	57.8	3.7	1.97	0.9224
	G2 27.2	16.5	50.5	5.8		
	G3 25.9	14.7	53.8	5.6		
Pack unburnable garbage out	G1 3.7	2.8	91.7	1.8	5.62	0.4670
	G2 7.8	3.9	85.3	2.9		
	G3 4.7	0.7	91.9	2.7		

1. G1: 1 - 2 times of the BMWC experience
   G2: 3 - 5 times of the BMWC experience
   G3: over 6 times of the BMWC experience
2. Degree of freedom = 6

4.6.4. Test of Hypothesis 4

Hypothesis 4 - There are no significant differences in the attitudes toward use control, wilderness regulations, and wilderness policies between hikers and horse users.

The main travel methods in the BMWC were hiking and horseback riding. The proportion of hikers (57 percent) was higher than that of horse users (36 percent). Chi-square tests were used to test whether any difference exists in the attitudes toward use control, wilderness regulations and wilderness policies between these two types of users.

Hikers' attitudes toward use control approaches were found more positive than the attitudes of horse users. For instance, most hikers (64.3 percent) supported the approach of "closing some area to use by horse parties" while only 16.4 percent of horse users supported it. Except for two regulations including "allow catching fish to eat but not to bring out" (sign. level .2849) and "pack unburnable garbage back out of wilderness" (sign. level .7043), hikers' attitudes toward the other four regulations were more positive than the attitudes of horse users.

The natural fire policy was favored more by hikers than by horse users (sign. level .0516) but there is no difference in the attitudes toward the natural fishery policy between them (sign. level .3316) at the .05 significance level. This probably indicates that the enjoyment of catching fish (not necessary to eat) is more common than agreement on ecological concepts. The policy of "administrative use of chain saw to clear trails of trees" was supported more by horse users than hikers (sign. level .0002). Perhaps it is more convenient for horse users to travel

on cleared trails. No difference was found in attitudes toward the ranger policy (sign. level .8376), however, more hikers as well as horse users (about 50 percent) supported this policy than opposed it (about 10 percent) (table 17)

In general, there was a strong relationship between visitor attitudes and their travel methods. The attitudes of hikers were more positive and supportive toward use control, wilderness regulations and policies than the attitudes of horse users. Thus, this hypothesis could be rejected at the .05 significance level.

Table 17. Tests of Hypothesis 4. The relationship between visitor's travel methods and their attitudes.

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	11.7/14.8	5.4/8.8	73.5/63.0	9.3/13.4	8.26	0.0410
Permit for assigned campsite	72.4/86.4	8.8/5.5	5.3/4.5	13.6/3.6	20.16	0.0002
Limit party size to 12 people	15.5/29.4	21.6/17.4	57.2/49.5	5.7/3.7	18.24	0.0004
Close area for horse use	16.3/71.2	15.0/8.2	64.3/16.4	4.3/4.1	206.57	0.0000
Wilderness regulations						
No woodfire if deadwood is scarce	26.6/56.4	12.3/10.0	45.7/20.9	15.4/12.7	61.86	0.0000
No horse grazing	17.1/61.8	24.3/7.3	36.6/10.0	21.9/20.9	154.43	0.0000
Require registration	17.6/29.5	23.9/27.3	55.3/38.2	3.3/5.0	20.63	0.0001
No camping within 200 ft. of waters	44.8/58.9	10.9/6.4	30.6/23.3	3.8/11.4	12.62	0.0055
Catch fish to eat but not to bring out	24.9/24.5	13.8/19.1	56.8/53.2	4.6/3.2	379	0.2849
Pack unburnable garbage out	6.5/4.5	2.8/3.2	88.3/89.1	2.4/3.2	1.41	0.7043
Wilderness policies						
Natural fire	26.6/35.0	18.1/21.2	52.8/42.4	2.5/1.5	7.74	0.0516
Natural fishery	45.2/50.5	23.5/24.3	29.9/23.4	1.3/1.9	3.42	0.3316
Administrative use of chain saw	31.1/29.4	25.9/15.6	31.4/47.2	11.6/7.8	19.34	0.0002
Ranger patrolling	12.2/11.3	27.9/30.3	50.1/50.2	9.8/8.1	0.85	0.8376

1. Numbers in the left hand side represent the percentages of hikers
   Numbers in the right hand side represent the percentages of horse users.
2. Degree of freedom = 3

4.6.5. Test of Hypothesis 5

Hypothesis 5 - There are no significant differences in the attitudes toward use control, wilderness regulations, and wilderness policies between day-users and campers.

About 70 percent of the visitors to the BMWC were campers. Because campers stayed longer and traveled deeper into the wilderness than day-users, it is obvious that campers were involved in wilderness more than day-users. Chi-square tests were used to compare how this situation affects visitor attitudes toward use control, wilderness regulations, and wilderness policies.

It is predictable that more campers than day-users opposed the use control approach of "issuing permits for assigned campsites" (sign. level .0003) because day-users would be less affected by this approach. However, about 70 percent of day-users still favored this approach because it is possible for them to be campers in future trips. The approach of "closing some areas to use by horse parties" was considered undesirable by more campers than day-users (sign. level .0001). That most horse users (91 percent) were campers might contribute to this result. No difference in the attitudes toward two other approaches, "limit use in an overused area" (sign. level .1653) and "limit party size to 12 people" (sign. level .5435), were found at the .05 significance level.

The attitudes of both day-users and campers toward the regulations of "require registration when entering wilderness" (sign. level .3405) and "pack unburnable garbage back out of wilderness" (sign. level .1339) supported the null hypothesis at the .05 significance level. Campers would be more affected by the regulations of "prohibiting wood fires if dead wood is scarce", "prohibiting horse

grazing", and "prohibiting camping within 200 feet of lakes or streams", thus, more campers opposed these regulations. More day-users disagreed with the regulation of "allow catching fish to eat but not to bring out" than campers, probably because it is more convenient for day-users to bring out fish than for campers.

No differences in attitudes toward the natural fire policy (sign. level .6038) and the natural fishery policy (sign. level .9700) were found at the .05 significance level. More day-users as well as campers favored the natural fire policy than opposed it, but an opposite result was found for the natural fishery policy. Fewer day-users (22 percent) opposed the policy of "administrative use of chain saw to clear trails of trees" than campers (34.8 percent). This probably indicates that day-users prefer convenient trails. About the same percentage (50 percent) of day-users and campers favored the ranger policy but fewer day-users (7 percent) said it was undesirable than campers (13.5 percent) (table 18).

In general, the attitudes of day-users seemed a little more supportive toward use control, wilderness regulations and wilderness policies than the attitudes of campers. Perhaps most of these approaches and regulations were more relevant to campers than to day-users, and consequently influenced campers' freedom and convenience. This hypothesis was generally rejected at the .05 significance level, especially in regard to their attitudes toward wilderness regulations.

Table 18. Tests of Hypothesis 5. The relationship between visitor use type and their attitudes

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	10.3/14.2	7.5/5.4	73.8/68.5	8.4/11.9	5.09	0.1653
Permit for assigned campsite	69.0/81.4	13.6/5.2	6.6/4.3	10.8/9.1	18.84	0.0003
Limit party size to 12 people	18.7/20.4	23.4/18.6	52.8/55.7	5.1/5.2	2.14	0.5435
Close area for horse use	21.8/39.5	16.7/12.0	56.9/44.2	4.6/4.3	21.71	0.0001
Wilderness regulations						
No woodfire if deadwood is scarce	26.6/40.6	13.1/10.5	39.3/36.7	21.0/12.2	17.12	0.0007
No horse grazing	24.2/36.3	21.9/17.1	32.1/24.9	21.9/21.7	11.63	0.0088
Require registration	19.0/22.0	29.2/22.9	47.7/50.9	4.2/4.2	3.35	0.3405
No camping within 200 ft. of waters	41.4/53.3	10.2/9.1	33.5/25.2	14.9/12.4	9.01	0.0292
Catch fish to eat but not to bring out	32.2/22.8	15.4/15.1	46.7/58.8	5.6/3.3	11.3	0.0102
Pack unburnable garbage out	7.9/4.6	3.3/2.9	85.1/90.6	3.7/1.9	5.58	0.1339
Wilderness policies						
Natural fire	30.3/29.6	16.3/19.4	50.5/49.3	2.9/1.7	1.85	0.6038
Natural fishery	46.9/47.1	23.0/23.2	28.2/28.3	1.9/1.4	0.24	0.9708
Administrative use of chain saw	22.0/34.8	29.4/19.6	36.9/36.0	11.7/9.5	15.2	0.0017
Ranger patrolling	7.0/13.5	30.2/28.7	49.8/49.7	13.0/8.1	9.56	0.0227

1. Numbers in the left hand side represent the percentages of day-users
   Numbers in the right hand side represent the percentages of campers.
2. Degree of freedom = 3

4.6.6. Test of Hypothesis 6

> Hypothesis 6 - There are no significant differences in the attitudes toward use control, wilderness regulations, and wilderness policies between hikers who perceived use conflict against horse users and those who didn't.

The conflict between hikers and horse users was defined by asking visitors to respond to "what was most dissatisfying about this trip (the low-points)". Because hikers were not mentioned as "low-points" or sources of dissatisfaction by horse users in the study data, the conflict appears to be asymmetrical, with hikers conflicting with horse users but not vice versa (Fitzhugh 1985).

About 12 percent of hikers (n=460) identified either "too many horse parties" or "horse manure" as low-points in their trips to the BMWC. Chi-square tests were used to test whether any differences in attitudes toward use control, wilderness regulations, and wilderness policies exist between these two groups of hikers.

The results indicated that among those hikers who had conflict with horse users, most of them (95 percent) supported the use control approach of "closing some area to use by horse parties" (sign. level .0000). No differences were found in their attitudes toward the other three approaches.

More of those hikers who had conflicts with horse users supported the regulations of "prohibiting wood fires if the dead wood is scarce" (sign. level .0009) and "prohibiting horse grazing" (sign. level .0000) than those without conflict. Their attitudes toward the other four regulations supported the null hypothesis at the .05 significance level.

Those hikers who identified conflicts with horse users could be closer to "purist" than those who didn't, because more of the former (70 percent) had positive attitudes toward the natural fire policy (sign. level .0427) than the latter (50 percent), and more of the hikers without conflict (47 percent) than those with conflict (34 percent) disagreed with the natural fishery policy (sign. level .0090). There were no differences in attitudes toward the other two policies, "administrative use of chain saws to clear trails of trees" (sign. level .1018) and "rangers or patrolmen in wilderness" (sign. level .1879), between these two groups of hikers at the .05 significance level (table 19).

In general, this hypothesis was rejected at the .05 significance level if it was tested by focusing on the dependent variables relative to the conflict between hikers and horse users. Thus, the correspondence between two variables must be considered in conducting a statistical test.

Table 19. Tests of Hypothesis 6. The relationship between hikers' conflict with horse users and their attitudes

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	7.0/12.4	3.5/5.7	82.5/72.2	7.0/9.7	2.77	0.4282
Permit for assigned campsite	71.9/72.5	3.5/9.5	5.3/5.3	19.3/12.8	3.63	0.3049
Limit party size to 12 people	7.1/16.7	17.9/22.1	69.6/55.5	5.4/5.7	5.03	0.1696
Close area for horse use	5.3/17.9	0.0/17.1	94.7/60.0	0.0/5.0	26.79	0.0000
Wilderness regulations						
No woodfire if deadwood is scarce	16.4/28.0	7.3/13.0	70.9/42.3	5.5/16.8	16.45	0.0009
No horse grazing	8.8/18.3	12.3/26.1	68.4/32.1	10.5/23.6	28.39	0.0000
Require registration	15.8/17.8	19.3/24.5	61.4/54.5	3.5/3.2	1.13	0.7689
No camping within 200 ft. of waters	37.5/45.8	12.5/10.7	35.7/29.9	14.3/13.7	1.46	0.6907
Catch fish to eat but not to bring out	12.3/26.7	12.3/14.0	70.2/54.9	5.3/4.5	6.39	0.0942
Pack unburnable garbage out	3.5/6.9	0.0/3.2	94.7/87.4	1.8/2.5	3.13	0.3716
Wilderness policies						
Natural fire	15.1/28.2	15.1/18.5	69.8/50.4	0.0/2.9	8.17	0.0427
Natural fishery	33.9/46.8	41.1/21.0	25.0/30.6	0.0/1.5	11.57	0.0090
Administrative use of chain saw	36.8/30.3	35.1/24.6	21.1/32.8	7.0/12.3	6.21	0.1018
Ranger patrolling	14.0/11.9	15.8/29.6	57.9/49.0	12.3/9.5	4.79	0.1879

1. Numbers in the left hand side represent the percentages of those hikers who had conflict with horse users
   Numbers in the right hand side represent the percentages of those hikers who didn't have conflict with horse users.
2. Degree of freedom = 3

4.6.7. Test of Hypothesis 7

> Hypothesis 7 - There are no significant differences in attitudes toward use control, wilderness regulations, and wilderness policies between visitors who perceived bio-physical and social impacts and those who didn't.

About three-fourths of those who had previous BMWC experience said the quality of the area was about the same, while about 16 percent said it was getting worse. The quality of an area can be defined by visitors' feelings about bio-physical, social, and managerial attributes of that area. Chi-square tests were used to test how their feelings about these attributes would affect their attitudes.

Those who responsed to any one of the following items were considered as perceiving bio-physical impacts in the BMWC: 1) visitor's low-points including "hard to find a campsite", "poor campsite", "scenery disappointed", and "poor trails"; 2) pass up an available campsite because of its bad condition; 3) poor condition of the wilderness in terms of wear and tear from use, causing erosion and loss of vegetation, and in terms of litter; 4) problems in finding a campsite.

The results indicated that more than 60 percent of the visitors identified at least one bio-physical impact during their trip in the BMWC. The attitudes toward use control approaches including "limit use in an over-used area" (sign. level .0219), "limit party size to 12 people" (sign. level .0001) and "close some area to use by horse parties" (sign. level .0000) were found to be different between those who perveived bio-physical impacts and those didn't at the .05 significance level.

The regulations "prohibiting horse grazing" (sign. level .0108), "require registration when entering wilderness" (sign. level .0012), and "prohibiting camping

within 200 feet of lakes or streams" (sign. level .0042), were supported more by those who perceived bio-physical impacts than those who didn't. However, in their attitudes toward the regulations, "prohibiting wood fires when dead wood is scarce" (sign. level .7763), "allow to catch fish to eat but not to bring out" (sign. level .5419) and "pack unburnable garbage back out of wilderness" (sign. level .6564), no differences were found between these two groups of users at the .05 significance level.

The natural fire policy (sign. level .0185) was the only one where different attitudes were found between those who perceived bio-physical impacts and those who didn't at the .05 significance level. The other three policies, "natural fishery" (sign. level .7537), "administrative use of chain saw to clear trails of trees" (sign. level .2965), and "rangers or patrolmen in wilderness" (sign. level .2447), were found to support the null hypothesis at the .05 significance level (table 20).

Table 20. Tests of Hypothesis 7. The relationship between those who perceived bio-physical, managerial impacts and their attitudes

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	11.5/16.3	3.2/7.2	74.2/63.2	11.2/13.4	9.64	0.0219
Permit for assigned campsite	76.1/84.1	5.4/5.3	5.7/3.4	12.8/7.2	6.38	0.0946
Limit party size to 12 people	14.0/27.5	17.5/22.3	63.3/44.5	5.2/5.7	22.32	0.0001
Close area for horse use	30.1/46.9	9.7/13.5	56.0/34.3	4.3/5.3	24.9	0.0000
Wilderness regulations						
No woodfire if deadwood is scarce	36.2/39.7	9.8/10.5	39.1/34.9	14.9/14.8	1.1	0.7763
No horse grazing	28.8/39.9	16.8/16.8	31.1/19.7	23.4/23.6	11.18	0.0108
Require registration	15.9/29.0	22.9/22.9	55.5/45.2	5.7/2.9	15.96	0.0012
No camping within 200 ft. of waters	44.0/58.1	8.6/10.0	31.1/20.5	16.3/11.4	13.23	0.0042
Catch fish to eat but not to bring out	22.2/27.4	14.5/14.9	59.8/54.3	3.4/3.4	2.15	0.5419
Pack unburnable garbage out	3.7/4.3	2.3/3.8	92.4/89.6	1.7/2.4	1.61	0.6564
Wilderness policies						
Natural fire	23.7/36.6	19.2/16.5	54.7/44.8	2.4/2.1	10.01	0.0185
Natural fishery	45.0/48.0	24.8/20.8	28.5/29.2	1.7/2.0	1.2	0.7537
Administrative use of chain saw	36.2/33.0	22.2/17.5	32.8/38.3	8.8/11.2	3.69	0.2965
Ranger patrolling	10.9/14.7	25.7/30.3	53.7/46/4	9.7/8.5	4.16	0.2447

1. Numbers in the left hand side represent the percentages of those who perceived bio-physical, managerial impacts during their BMWC trip, and numbers in the right hand side represent those who didn't.
2. Degree of freedom = 3

Social impacts that visitors perceived were defined by visitors' responses about the number of other people they encountered in the wilderness and by asking them whether crowding was a problem in the wilderness they visited. Chi-square tests were used to test how this perception of social impacts would affect their attitudes toward use control, wilderness regulations, and wilderness policies.

About 30 percent of the visitors identified social impacts during their trips in the BMWC. Their attitudes toward use control approaches "limit use in an over-used area" (sign. level .0325) and "limit party size to 12 people" (sign. level .0034) were different between those who perceived social impacts and those who didn't at .05 significant level. They might perceive these two approaches as effective ones to reduce social impacts. No significant differences were found in their attitudes toward the other approaches, "issuing permits for assigned campsites" (sign. level .6089) and "closing some area to use by horse parties" (sign. level .1821), at the .05 significance level.

All regulations except "prohibiting horse grazing" (sign. level .0174) were found to support the null hypothesis at the .05 significance level. Perhaps these regulations were less related to social impacts they perceived. The same situation was found in attitudes toward wilderness policies, there were no significant differences in attitudes toward all the studied policies at the .05 significance level (table 21).

In general, this hypothesis was partly supported by the results at the .05 significance level. Visitor attitudes toward use control and wilderness regulations were more influenced by their perceptions of bio-physical impacts than their

perceptions of social impacts. The attitudes of those who perceived impacts in the BMWC tended to be more supportive toward use control and wilderness regulations than the attitudes of those who did not.

Table 21. Tests of Hypothesis 7. The relationship between visitors' perceptions of social impacts and their attitudes.

Use control approaches	Undesirable	Don't care	Desirable	Desirable in high used area	Chi-square	Sign. level
Limit use in over used area	10.1/14.0	2.5/7.3	74.9/68.4	12.6/10.3	8.77	0.0325
Permit for assigned campsite	75.9/78.1	6.5/7.9	5.5/4.9	12.1/9.1	1.83	0.6089
Limit party size to 12 people	14.6/21.3	14.1/22.6	65.2/51.4	6.1/4.7	13.68	0.0034
Close area for horse use	30.5/35.4	10.5/14.3	54.5/45.8	4.5/4.5	4.86	0.1821
Wilderness regulations						
No woodfire if deadwood is scarce	38.4/35.4	7.6/12.8	36.9/37.6	17.2/14.2	4.64	0.2001
No horse grazing	29.6/33.7	13.1/20.9	30.2/26.0	27.1/19.5	10.15	0.0174
Require registration	18.0/22.3	24.0/24.6	51.0/49.8	7.0/3.3	5.78	0.1229
No camping within 200 ft. of waters	42.6/52.8	9.6/9.4	33.0/25.2	14.7/12.5	6.61	0.0856
Catch fish to eat but not to bring out	23.0/26.8	11.7/16.2	59.2/54.0	6.1/2.9	7.19	0.0662
Pack unburnable garbage out	3.5/6.5	3.0/3.1	92.5/87.7	1.0/2.7	4.62	0.2018
Wilderness policies						
Natural fire	25.5/31.3	15.6/18.9	55.2/48.3	3.6/1.5	6.74	0.0805
Natural fishery	43.4/48.3	24.2/22.5	31.8/27.2	0.5/2.0	4.00	0.2615
Administrative use of chain saw	37.2/28.9	20.1/23.3	31.7/37.9	11.1/9.9	5.59	0.1333
Ranger patrolling	11.5/11.7	24.5/31.3	53.0/48.1	11.0/8.8	3.70	0.2963

1. Numbers in the left hand side represent the percentages of those who perceived social impacts during their BMWC trips. Numbers in the right hand side represent the percentages of those who didn't perceived social impact.
2. Degree of freedom = 3.

4.7. Summary of the tests of the hypotheses

The conclusion of each test of hypothesis was not generally acceptable or unacceptable but very specifically aimed at every statement of each category. Because the response scales used in this study were not designed as a continuum, it is inappropriate to give a certain score to each scale and sum them up to be a number which represents an attitude of some individual toward an object such as use control, wilderness regulation or wilderness policy. Table 22 summarized the results of the tests of the hypotheses.

Table 22. Summary of Hypotheses Tests.

Attitudes toward:	Tests of Hypotheses												
			H 3									H 7	
	H 1	H 2	H3a	H3b	H3c	H3d	H3e	H3f	H 4	H 5	H 6	H 7i	H 7 ii
Use Control Approaches													
Limit use in over used area	v	v					v	v	v			v	v
Permit for assigned campsite	v		v	v			v		v	v			
Limit party size to 12 people	v	v	v	v	v				v			v	v
Close area for horse use	v	v	v	v	v	v	v		v	v	v	v	
Wilderness Regulations													
No woodfire if deadwood is scarce	v		v	v			v		v	v	v		
No horse grazing	v	v	v	v	v	v	v		v	v	v	v	v
Require registration	v			v	v	v	v		v			v	
No camping w/in 200ft of waters	v		v		v			v	v	v		v	
Catch fish to eat but not bring out	v		v	v						v			
Pack unburnable garbage out		v											
Wilderness Policies													
Natural fire			v	v	v						v	v	
Natural fishery	v										v		
Administrative use of chain saw						v		v	v	v			
Ranger patrolling	v									v			

1. There are 6 independent variables in Hypothesis 3, which included education levels, residence, any wilderness experience, levels of any wilderness experience, the BMWC experience, and levels of the BMWC experience.
2. There are 2 independent variables in Hypothesis 7, which included perceptions of bio-physical, managerial impacts, and social impacts.
3. "v" represents rejection of null hypothesis at .05 significant level ($p<.05$).

Chapter 5

Discussion and Summary

5.1. Discussion

As illustrated in the conceptual framework of chapter 2, an attitude consists of three components - cognitive, affective, and behavioral. Visitor attitudes were defined by responses to each statement in terms of how desirable or undesirable they considered, it indicated visitor attitudes in this study were focused on the affective component. However, in the hypothesis tests, visitor attitudes toward the studied objects - use control, wilderness regulations and wilderness policies - were tested on the basis of their cognitive beliefs, behavior, and backgrounds.

Some of the results have revealed the appropriateness of using the conceptual framework stated in chapter 2. The correspondence between the attitude variables and the independent variables probably could explain why some other results didn't fit the framework. For example, it does not seem appropriate to relate user conflicts with the regulation of "catch fish to eat but not bring out". Because no data were available in this survey to test the influences of attitudes on behavioral intentions and in turn on behaviors, further studies are needed to measure the application of this framework in these areas.

Visitors come to the BMWC for their own reasons. The degree of importance indicated for each of the ten possible reasons in this study show that visitors tend

to emphasize contemplative recreation more than consumptive recreation. This situation may be due to the success of those who have advocated the ideas and values of wilderness. It should greatly encourage people to continue the compaign for wilderness preservation.

From the results of investigating visitor attitudes toward use control, wilderness regulations and wilderness policies, we learned that visitors generally did not favor the appproaches or regulations that would affect their freedom or benefits after they arrived at the wilderness areas. Examples are: the use control approach of "issuing permits for assigned campsites"; the regulations of "prohibiting wood fires if dead wood is scarce", "prohibiting horse grazing" and "prohibiting camping within 200 feet of lakes or streams"; and the policy of "natural fishery". Managers need to seek effective methods to provide visitors with information about these approaches or regulations in advance of their trips.

Visitor attitudes toward some of the use control approaches, wilderness regulations and wilderness policies did differ because of their backgrounds, use types, travel methods, and perceptions of wilderness. However, some attitudes were not significantly different among visitors. Perhaps these regulations and policies have been accepted by the public due to effective information or education programs. For instance, there are almost no differences among visitors in their attitudes toward the regulation of "pack unburnable garbage back out of wilderness", and the policy of "rangers or patrolmen in the backcountry".

By examining how visitor's residence affected their attitudes toward the 14 statements in this study, the results indicated that current residences had more

influence on the differences of visitor attitudes than their residences before age 18 did. Interestingly, we found that the attitudes of those currently living in urban areas seemed closer to "purist" than those currently living in rural areas. Perhaps those living currently in urban areas were more used to various regulations or rules, such as traffic rules or regulations, than those living in rural areas. However, this factor does not seem to be useful for visitor management in wilderness areas because it is difficult to recognize "who is from where" and then to apply different programs.

Whether visitors had any wilderness experience did have more influence on their attitudes than how much experience they have had. In addition, BMWC experience had more influence on attitudes than non-BMWC experience. This would indicate that managers need to actively contact new comers to the BMWC and provide them with information or education programs.

Similar to the findings of many previous studies, the attitudes of hikers in general were found closer to "purist" than the attitudes of horse users. Horse users seemed to be more concerned about their convenience and comfort than about the wilderness resource itself; and they were more tolerant of bio-physical and social impacts than were hikers. Horse use could result in more bio-physical impact than hiker use, and it caused hikers to perceive conflicts with horse users. To minimize this situation, managers may use zoning approaches such as timing or spatial separation as well as information or education programs such as recommendations of appropriate behavior. However, it is essential to tell visitors "what or how to do it" along with "why to do it" because visitor cooperation to

maintain the quality of the wilderness is more effective than managers' efforts alone.

Quality recreation in wilderness areas depends on visitors' evaluation of bio-physical (including managerial) attributes and social attributes. In this study, about 60 percent of the visitors identified at least one item of bio-physical impact during their trips such as poor trails or campsites, disappointing scenery, wear of vegetation, litter, problem of finding a campsite etc., while about 30 percent of the visitors reported at least one item of social impact such as being too crowded. This indicates that visitors might be more sensitive to bio-physical impacts than to social impacts. Thus, if setting up priorities for wilderness management is necessary, managers should consider approaches for improving bio-physical impacts before improving social impacts.

It is a challenging task for a manager to deal with visitor attitudes that are not congruent with the principles of the Wilderness Act. For example, what if most visitors don't favor the approach of "issuing permit for assigned campsite" or the regulation of "prohibiting horse grazing" or "prohibiting camping within 200 feet of lakes or streams" or the policy of "natural fishery - no stocking, and barren lakes left barren"? At this point, the managers may offer information or education programs to try to change visitors' attitudes toward wilderness regulations and wilderness policies. However, after precise evaluation of the current situation and possible impacts, the managers probably could consider an approach that would meet most visitors' demands. For instance, the managers may stock a barren lake with fish of a native species to offer more fishing opportunities; or allow

administrative use of chain saws to clean trails of trees.

This study focused on visitor attitudes toward use control, wilderness regulations and wilderness policies. The results have shown that a diversity of attitudes exist among visitors. Although attitudes are not an efficient predictor of behaviors, they provide very useful information, which can be an important input for managers in their decision-making process (Stankey 1973, Heberlein 1973). Visitor attitudes can be affected and changed by reforming his or her attitude structure which includes three components - cognitive, affective, and behavioral. For example, a visitor may not quite understand the value or philosophy of wilderness, and this may lead to a negative attitude toward some wilderness policy such as natural fire policy. If the manager can realize this and offer proper information or education programs then the visitor may accept and change his or her belief about natural fire and finally have a positive attitude toward this policy. Thus, through a carefully designed survey of visitor attitudes, the results can provide managers with important insight to the goals and objectives of wilderness visitors and this can help managers carry out their duties.

Wilderness recreation is characterized by its freedom of choice and unconfined style. Though light-handed management approaches are favored by most wilderness visitors, once impacts or problems occur and the situation is beyond what the light-handed approaches can help, direct management approaches become necessary and important. Before implementing certain direct approaches, the managers had better have information about visitor attitudes toward those approaches.

5.2. Management implications

In this study, we learned that the BMWC offers a broad diversity of recreation opportunity. Visitors came to the BMWC with various expectations to seek different wilderness experiences which ultimately lead to satisfaction and benefits. In order to provide visitors with quality recreation experiences, it is very important to direct visitors to having appropriate expectations about their wilderness trips before they hit the trail. Information designed according to the recreation opportunity spectrum (ROS) planning technique (Stankey and Clark 1979) can meet this need. For instance, a semiprimitive wilderness area where high quality trails are available could be appropriate for horse users or day users; backpackers might choose a more primitive trail to avoid possible conflict with horse users; and they might go deeper into the primitive areas to experience more solitude and less regimentation. Information should not be too detailed to protect visitors' sense of discovery.

Visitors to the BMWC generally agreed with the implementation of some direct management approaches or regulations in the case of some impacts. However, managers have the task of deciding when to start this regimentation. The limits of acceptable change (LAC) managing technique (Stankey et al. 1984) can help managers to decide the time and the place. When certain indicators in an area are found beyond its standard, then, some direct management actions could be chosen after evaluating all possible alternatives.

Promoting mutual understanding between visitors and managers through communication techniques is very important in today's government operations.

Whether a policy is supported by the public or not depends partly on how well people understand it. Therefore, the Forest Service should cooperate with scientific researchers to conduct necessary surveys to obtain information that could be imparted to the public through appropriate communication techniques. This would improve its wilderness management programs.

This study found that visitors care about their enjoyment of wilderness and their benefits. Some regulations and policies such as "prohibiting camping within 200 feet of lakes or streams", "a natural fishery – no stocking, and barren lakes left barren", and "administrative use of chain saw to clear trails of trees" may be reconsidered by the managers. Providing visitors with information about appropriate behavior when they are camping beside lake or stream is more essential than prohibiting them to camp within 200 feet of lakes or streams. Stocking barren lakes with fish of native species may be welcome by most visitors and add more fun for their trip. Clearing trees of trails may reduce bio-physical impacts caused by visitors' detouring, especially by horse users.

Rangers working in the wilderness play an important role in today's wilderness management because of growing use level. They are helpful and served as source of information. Rangers' role is definitely supported by most visitors in the BMWC. Thus, asking visitors to pay or donate some money, such as $5.00 per visitor, may aid Forest Service's budget to hire more rangers to serve visitors.

The results of this study indicated that visitors perceived bio-physical and managerial impacts more than social impacts. The manager may consider using

some artificial methods to recover certain bio-physical impacts such as vegetation damage, compacted soils. Replanting of ground cover in seriously damaged areas and gravelling of moddy trails in high horse-use areas may contribute to impact recovery. Some artificial methods may be contradictory to the principles of the Wilderness Act, but the manager must face the fact that once man gets involved into the wilderness where used to be untrammelled, it is unrealistic to say to maintain the wilderness condition the same as before the first European stepped onto it.

5.3. Suggested future relative research in the BMWC

If the Forest Service's budget permits, it would be advisable to do a survey of the relationship between visitor attitudes and their real behaviors. In addition, a survey investigating the changes of visitor attitudes after the provision of information or education programs is also suggested.

The contents of any information or education programs probably need to be examined to find out which style is more popular. Managers may be interested in cooperating with art designers to develop both popular and effective programs.

5.4. Summary

The data used in this study was collected by Dr. Lucas from visitors to the BMWC in 1982. He has offered a general analysis (Lucas 1985) of this data. This study was focused specifically on visitor attitudes toward use control, wilderness regulations, and wilderness policies.

The conceptual framework developed by Fishbein and Ajzen (1975) and Iso-

Ahola (1980) regarding the relationship between beliefs, attitudes, intentions, and behaviors was applied in this study. However, it was not possible to examine the relationship between visitor attitudes and their real behaviors by using this data. In general, the results have revealed the appropriateness of using this conceptual framework.

Because the response scales of each statement in this study were not designed in a continuum style, it is more appropriate to analysize visitor attitudes toward each statement related to the independent variables than to give each scale a certain score and sum them up to be a number which represents the general attitude of a visitor. Thus, Chi-square tests and tabulations in percentages were used in the data analysis of this study.

In the analysis of visitors' reasons for choosing to visit the BMWC instead of some other kind of recreation area, the results indicate that visitors put more emphasis on contemplative recreation styles, such as to enjoy scenic beauty, to relax, to escape civilization, to experience solitude, than consumptive ones such as to hunt or to fish. Visitors also gave very high evaluation to the importance of wilderness. From these two points, it is clear that the efforts of promoting wilderness preservation by both enthusiastic people and the Forest Service have had positive results.

Visitor attitudes toward some use control approaches, wilderness regulations, and wilderness policies were found different based on the analyses of the independent variables including their beliefs about wilderness, background, travel methods, use styles, and their perceptions of wilderness impacts. However, visitor

attitudes toward some other management strategies were not significantly different. For example, no significant differences were found in their negative attitudes toward the use approach of "issuing permits for assigned campsites" and in their positive attitudes toward the regulation of "pack unburnable garbage back out of wilderness" and the policy of "rangers or patrolmen in the backcountry".

Visitors to the BMWC generally supported direct management strategies if the site situations are bad or for the sake of protecting the wilderness. However, the results revealed that the attitudes of those who had contemplative beliefs, or hikers, or those who perceived impacts, conflict as a problem were found more positive than the attitudes of those who had consumptive beliefs, or horse users, or those who didn't perceive impacts and conflict as a problem. In addition, visitors with higher education levels, or with wilderness experience (but not completely related to the levels of experience), or from urban areas, had attitudes which were more positive than the attitudes of those with lower education levels, or without wilderness experience, or from rural areas.

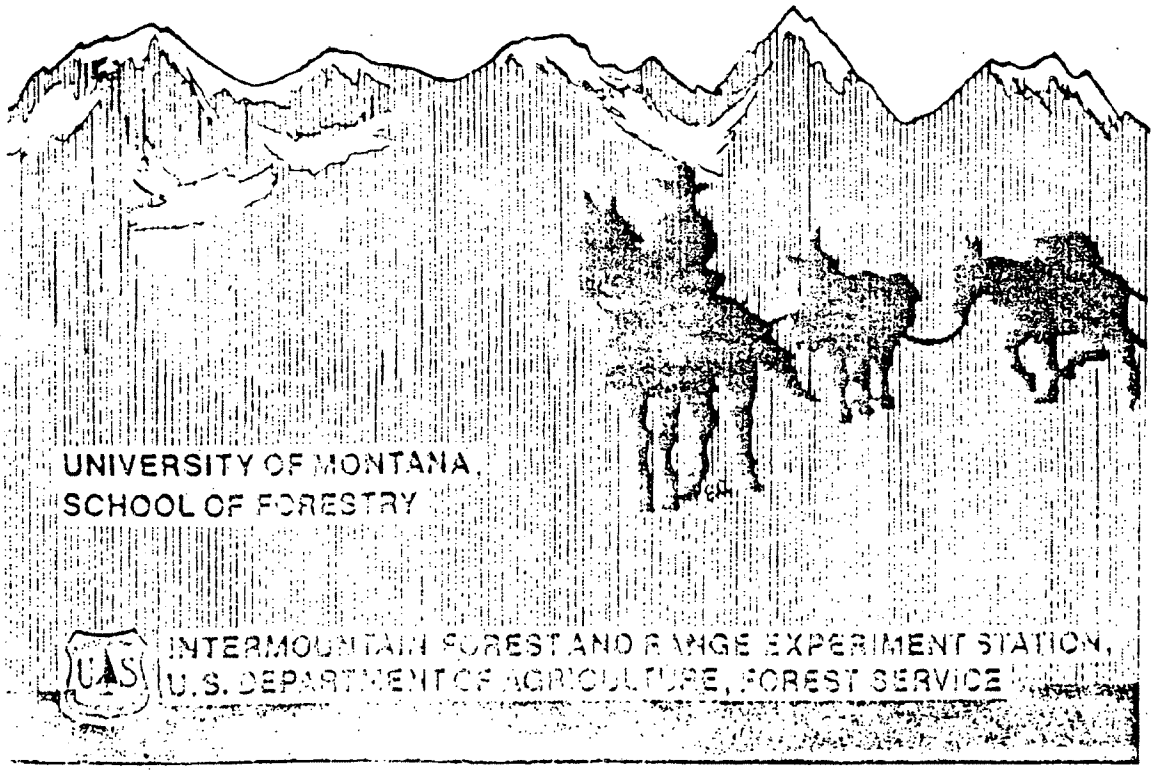
Although visitor attitude is not a good or effective predictor of the real behaviors related to wilderness affairs, it still plays an important role as a reference for managers in their decision-making process. More efforts need to be put on studies which investigate the relationships between visitor attitudes and their real behaviors, and on methods to make visitor attitudes be as congruent with their real behaviors as possible.

Appendix A

Questionnaire

WILDERNESS VISITOR STUDY

Bob Marshall
Great Bear
Scapegoat



FORM APPROVED
OMB NO. 0596-00-71

Wilderness Visitor Study

All of the following questions refer to the Wilderness visit you made about _____, 1982, entering at _____.

IMPORTANT! The term "Wilderness" in this questionnaire means the roadless, undeveloped country reached only by trails or rivers. These questions refer only to the Wilderness portion of your trip, not to places along the road.

First, we would like to know about some of the things your party did on this visit.

1. How did you travel in the Wilderness (the roadless country) on this visit? (Check all that apply, but if more than one, underline the way you traveled most.)

[ ] HIKED, CARRYING OUR EQUIPMENT OURSELVES

[ ] RAFT, CANOE, KAYAK, ETC.

[ ] HIKED, LEADING HORSES OR MULES

[ ] HORSEBACK

[ ] OTHER (describe _____)

2. If your party used horses or mules, please answer the following question. (If not, please skip to QUESTION 3.)

a. How many horses or mules did your party take? _____

b. Was supplemental feed packed in?

[ ] NO

[ ] YES → If Yes: What kind of feed? [ ] HAY; [ ] GRAIN; [ ] PELLETS

c. How were most of the horses or mules handled at night?

[ ] KEPT IN A CORRAL [ ] TURNED LOOSE [ ] HOBBLED

[ ] TIED TO TREES [ ] PICKETED

[ ] TIED TO A ROPE STRETCHED BETWEEN TREES

[ ] OTHER (explain _____)

3. Which of the following things did you do in the Wilderness on this visit? (Check only those things that you personally did.)

[ ] FISH
[ ] HUNT
[ ] HIKE
[ ] RAFTING OR OTHER BOATING
[ ] SWIM
[ ] TAKE PICTURES (PHOTOGRAPHY)
[ ] NATURE STUDY (BIRD WATCHING, IDENTIFYING WILD FLOWERS, ROCK STUDY, ETC.)
[ ] MOUNTAIN CLIMB (USING ROPES, SPECIAL EQUIPMENT, ETC., NOT JUST HIKING UP)
[ ] OTHER (describe _____)

4. Which of the following large wildlife did you see in the Wilderness?

[ ] GRIZZLY BEAR
[ ] BLACK BEAR
[ ] BEAR, NOT SURE WHICH KIND
[ ] ELK
[ ] DEER
[ ] MOUNTAIN GOATS
[ ] MOOSE
[ ] BIGHORN SHEEP
[ ] OTHER _____

If you were hunting, what did you get? _____

5. Did your party stay out overnight in the Wilderness, beyond the road, on this visit?

[ ] NO
[ ] YES → Total number of nights? _____. Did you:
[ ] HAVE A WOOD FIRE (CAMPFIRE)
[ ] USE A GAS STOVE
[ ] HAVE BOTH A WOOD FIRE AND GAS STOVE
[ ] NEITHER

6. Did an outfitter or guide go with you?

[ ] NO
[ ] YES → Was it a:
  [ ] FULLY OUTFITTED TRIP
  [ ] "SPOT PACK" OR "DROP CAMP" (brought in and left)

7. Did your party have maps or guidebooks for the Wilderness?

[ ] NO
[ ] YES → (What kinds? _____)

8. Was going to the Wilderness the SOLE purpose of this trip away from home, or were there other purposes for the trip, too (such as visiting another recreation area or park or visiting friends along the way)?

[__] VISITING THE WILDERNESS WAS THE SOLE PURPOSE OF THIS TRIP

[__] VISITED ANOTHER PLACE OR PLACES ON THIS TRIP ALSO

9. Have you ever visited any Wilderness before this trip?

[__] NO —►SKIP TO QUESTION 11

[__] YES—►At about what age did you first visit a Wilderness? _ _ _ _ _

Was this with your parents? [__] NO; [__] YES -

Do you usually return to Wilderness places you have already visited, or do you spend most of your time hiking or riding in areas new to you?

[__] SPEND MOST OF MY TIME IN AREAS NEW TO ME

[__] SPEND MOST OF MY TIME REVISITING AREAS I'VE BEEN IN PREVIOUSLY

[__] SPEND MY TIME DOING BOTH OF THE ABOVE EQUALLY

10. Have you visited this Wilderness area before?

[__] NO —►GO TO QUESTION 11

[__] YES—►About how many times? _ _ _ _ _)

Would you say the quality of the area was:

[__] GETTING BETTER

[__] ABOUT THE SAME

[__] GETTING WORSE

What, if anything, seemed different?

_ _

_ _

_ _

11. Did you personally choose (or help choose) the trailhead where you entered the Wilderness?

[__] YES—►CONTINUE WITH QUESTION 12

[__] NO —►Who did choose?

[__] AN OUTFITTER OR GUIDE

[__] SOMEONE ELSE IN YOUR PARTY

[__] OTHER (explain _)

NOW SKIP TO QUESTION 16

12. How long before you visited the Wilderness did you choose the trailhead where you entered the area?

[__] ON THE WAY
[__] LESS THAN 24 HOURS BEFORE
[__] 24 HOURS TO 1 WEEK BEFORE
[__] 1 WEEK TO 1 MONTH BEFORE
[__] MORE THAN 1 MONTH BEFORE

13. How did you find out about the trailhead you chose? (Check all that were important.)

[__] BEEN THERE LOTS OF TIMES
[__] DON'T REMEMBER HOW I FOUND OUT ABOUT IT
[__] STUDIED A MAP
[__] TOLD BY FRIENDS OR RELATIVES
[__] SIGNS ALONG THE ROAD
[__] FOREST SERVICE RANGER (OR OTHER EMPLOYEE)
[__] A GUIDEBOOK
[__] NEWSPAPER STORY
[__] MAGAZINE STORY
[__] RADIO
[__] TV
[__] OTHER (explain _____)

14. What was there about this trailhead that caused you to choose it? (Check all that were important.)

[__] CLOSE TO HOME
[__] EASY TRAIL
[__] LESS CROWDED
[__] BEEN THERE BEFORE, FAMILIARITY
[__] A NEW AREA, VARIETY
[__] ACCESS TO GOOD FISHING OR HUNTING AREA
[__] OTHER (explain _____)

15. Did you consider some other trailheads, and reject them, before you finally chose the one where you entered?

[__] NO
[__] YES → What was there about rejected trailheads that caused you to choose another place? _____
_____

16. Did you contact the Forest Service to get information about the Wilderness before your trip?

[ ] NO → SKIP TO QUESTION 18

[ ] YES

17. a. Did you: (Check all that apply.)

[ ] VISIT A FOREST SERVICE OFFICE

[ ] TELEPHONE A FOREST SERVICE OFFICE

[ ] WRITE A FOREST SERVICE OFFICE

b. How well did the information you got from the Forest Service meet your needs?

[ ] VERY WELL

[ ] FAIRLY WELL

[ ] NOT VERY WELL

[ ] NO OPINION, OR DON'T REMEMBER

18. Including this visit, how many <u>times</u> did you visit a Wilderness in the past 12 months? _ _ _ _ _

How many total <u>days</u> did you spend in Wilderness areas on all visits in the past 12 months? _ _ _ _ _

The following questions ask for your personal opinion about the Wilderness you visited. This information will assist the Forest Service to better manage and protect the Wilderness.

19. What were your main reasons for choosing to visit this kind of area (a roadless Wilderness) instead of some other kind of recreation area? Please indicate the importance of each of the following by marking one answer after each statement.

	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT
To enjoy scenic beauty	[ ]	[ ]	[ ]
To fish	[ ]	[ ]	[ ]
To hunt	[ ]	[ ]	[ ]
To relax	[ ]	[ ]	[ ]
To exercise and get in shape	[ ]	[ ]	[ ]
To escape civilization	[ ]	[ ]	[ ]
To develop backcountry skills	[ ]	[ ]	[ ]
To experience solitude	[ ]	[ ]	[ ]
To face the challenge of wild country	[ ]	[ ]	[ ]
To avoid mechanized recreation	[ ]	[ ]	[ ]
Other reasons	[ ]	[ ]	[ ]

(explain _____)

20. How satisfied were you, personally, with this trip into the Wilderness? What kind of a grade would you give it? (Check one.)

[ ] A, VERY GOOD [ ] B, GOOD [ ] C, FAIR [ ] D, POOR [ ] F, VERY POOR

What was most satisfying about the trip? (The high points.) _____

_____

_____

What was most dissatisfying about the trip? (The low points.) _____

_____

_____

21. When you are camped in the Wilderness, about how many other parties would you prefer camped within sight or sound of your camp? _____

IF YOU DIDN'T CAMP OVERNIGHT IN THE WILDERNESS ON THIS TRIP, PLEASE SKIP TO QUESTION 29

22. On this trip into the Wilderness, were you able to find a campsite with this preferred number of other campers?

[ ] ALWAYS [ ] USUALLY (AT LEAST 1/2 TIME) [ ] SOMETIMES (LESS THAN 1/2 TIME) [ ] NEVER

23. When you were looking for a place to camp on this trip, did you take the first available campsite you found in the general area where you intended to stay?

[ ] ALWAYS [ ] USUALLY (AT LEAST 1/2 TIME) [ ] SOMETIMES (LESS THAN 1/2 TIME) [ ] NEVER

24. On this trip, did you pass up an available campsite because you didn't like the condition it was in? (The next question asks about location; now we just want to know if you passed up a campsite because of its condition.)

[ ] NO

[ ] YES → What didn't you like about it? (Check all that apply.)

[ ] LITTER (CANS, PAPER, ETC.)
[ ] FIREWOOD SCARCE
[ ] HORSE MANURE
[ ] CUT OR DAMAGED TREES
[ ] BARE GROUND OR DUST, EXPOSED TREE ROOTS, EROSION OF THE SOIL, ETC.
[ ] GRAZING FOR HORSES SCARCE
[ ] OLD CAMPFIRE REMAINS, ROCK FIRE RINGS, ETC.
[ ] OTHER (explain _____)

25. On this trip, did you pass up an available campsite in the area where you intended to stay because of its location?

[ ] NO

[ ] YES → If so, what was it that you didn't like about it?

[ ] POOR VIEW
[ ] TOO CLOSE TO OTHER OCCUPIED CAMPS
[ ] WATER TOO FAR AWAY
[ ] TOO CLOSE TO TRAIL; NO PRIVACY
[ ] OTHER (describe _____)

26. On this trip, did you purposely leave the trail to look for a campsite?

[__] NO

[__] YES

27. Did you have serious problems finding unoccupied places to camp?

[__] NO

[__] AT ONE PLACE

[__] AT MORE THAN ONE PLACE

28. On this trip did you generally use campsites that had been used before, or sites that hadn't been used before, as best as you could tell? (Check one.)

[__] USUALLY USED SITES THAT HADN'T BEEN CAMPED ON BEFORE

[__] USUALLY USED SITES THAT HAD BEEN CAMPED ON BEFORE

[__] USED BOTH SITES THAT HAD AND HADN'T BEEN USED BEFORE ABOUT EQUALLY

29. How did you feel about the number of other people you saw in the Wilderness on this visit? (Check one.)

[__] SAW WAY TOO FEW

[__] SAW TOO FEW

[__] ABOUT RIGHT

[__] SAW TOO MANY

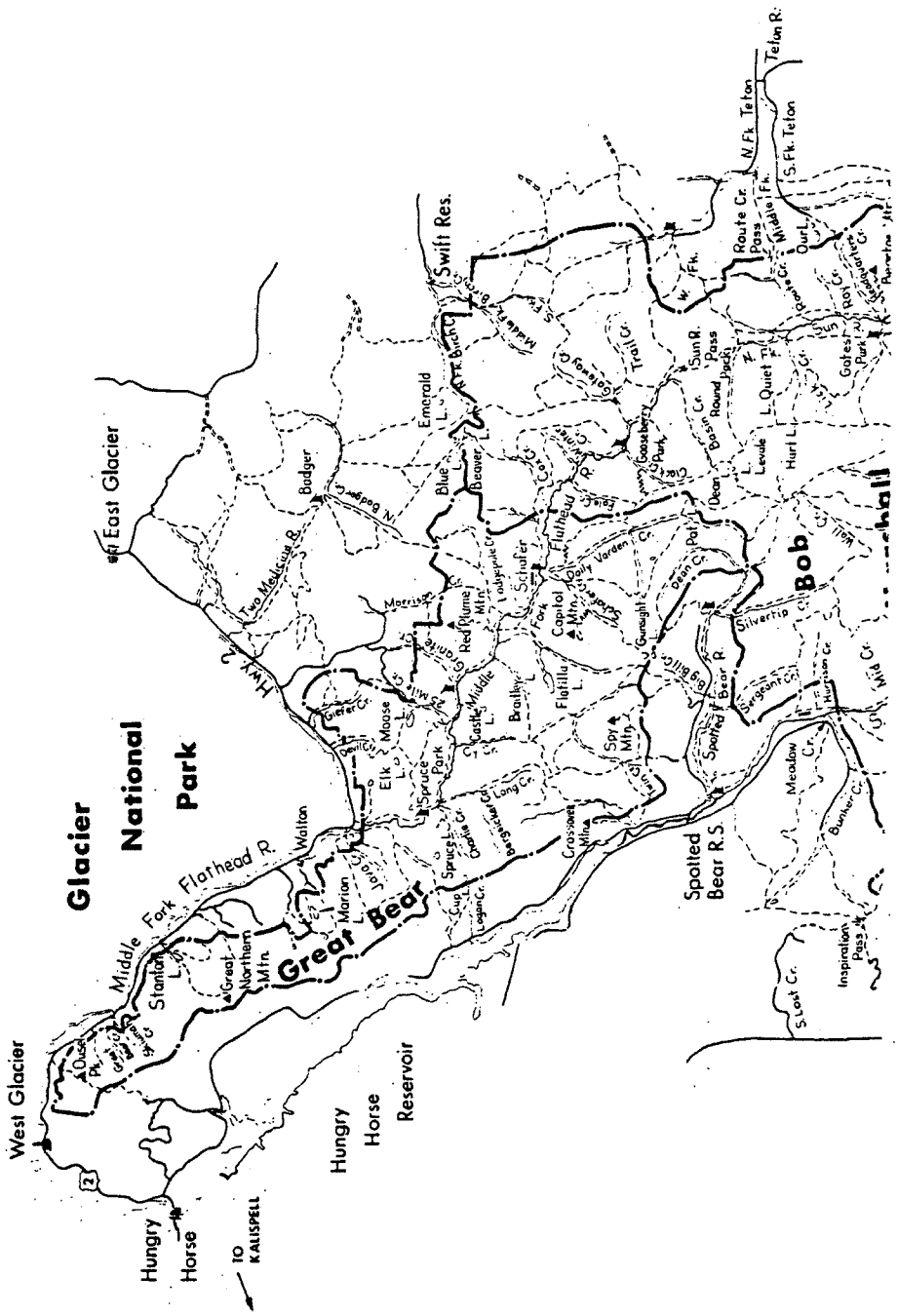
[__] SAW WAY TOO MANY

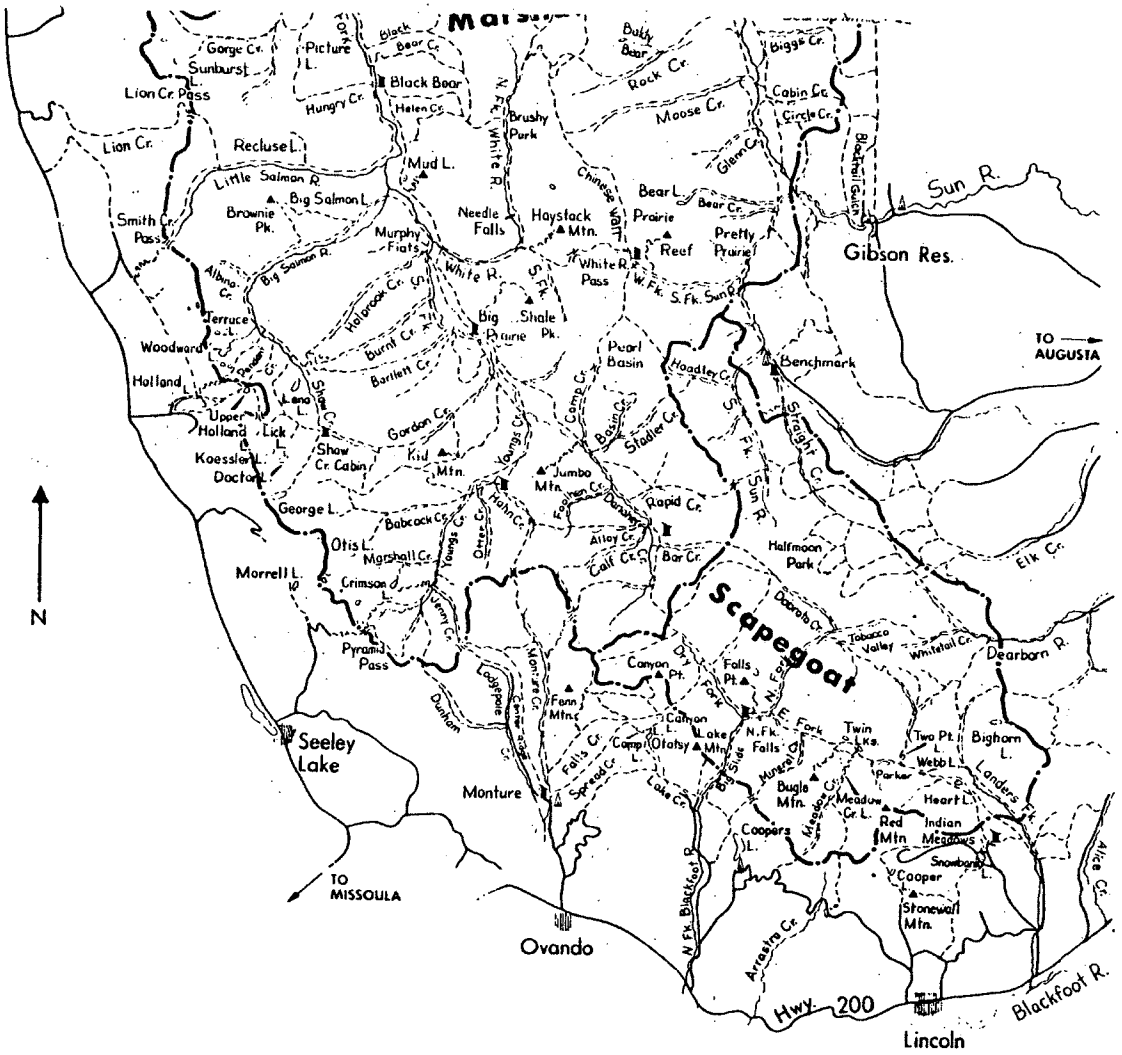
[__] DID NOT MATTER TO ME ONE WAY OR THE OTHER

[__] DO NOT REMEMBER

30. About how many other parties did you see in the Wilderness on this trip? _ _ _
How many of these were large parties (say, over 10 people)? _ _ _
How many of the parties had horses or mules? _ _ _

On the map below please: (A) Draw an arrow ⟶ along your route (off the road). Include any off-trail travel. (B) Mark your campsites with an "X" and write the number of nights you spent at each campsite next to the "X".




Gorge Cr.
Sunburst L.
Picture L.
Black Bear Cr.
Black Bear
Lion Cr. Pass
Hungry Cr.
Helen Cr.
Bully Bear
Rock Cr.
Biggs Cr.
Cabin Cr.
Circle Cr.
Lion Cr.
Recluse L.
Mud L.
N. Fk. White R.
Brushy Park
Moose Cr.
Glenn Cr.
Blackfoot Gulch
Sun R.
Little Salmon R.
Big Salmon L.
Brownie Pk.
Smith Cr. Pass
Needle Falls
Haystack Mtn.
Chinese Wall
Bear L.
Bear Cr.
Prairie
Reef
Pretty Prairie
Gibson Res.
Murphy Flats
White R.
S. Fk. White R.
White R. Pass
W. Fk. S. Fk. Sun R.
Big Prairie
Shale Pk.
Albino Cr.
Big Salmon R.
Halfmoon Cr.
Burnt Cr.
Bartlett Cr.
Terrace L.
Woodward L.
Pearl Basin
Hoadley Cr.
Benchmark
TO AUGUSTA
Holland L.
Upper Holland L.
Lena L.
Lick L.
Koessler L.
Doctor L.
Shaw Cr.
Shaw Cr. Cabin
Gordon Cr.
Kid Mtn.
Young Cr.
Camp Cr.
Basin Cr.
Stadler Cr.
Jumbo Mtn.
Straight Cr.
S. Fk. Sun R.
George L.
Babcock Cr.
Hahn Cr.
Foolhen Cr.
Rapid Cr.
Otis L.
Marshall Cr.
Alley Cr.
Calf Cr.
Bar Cr.
Halfmoon Park
Elk Cr.
Morrell L.
Crimson L.
Scapegoat
Dearborn Wilderness
Tobacco Valley
Whitetail Cr.
Dearborn R.
Pyramid Pass
Canyon Pt.
Falls Pt.
N. Fk. Dry Fork
Dry Fork
Fenn Mtn.
Camon L.
Lake Mtn.
N. Fk. Falls Cr.
Twin Lks.
Two Pt. L.
Bighorn L.
Webb L.
Parker
Seeley Lake
Monture
Falls Cr.
Camp L.
Otatsy
Spread Cr.
Lake Cr.
Bugle Mtn.
Meadow Cr. L.
Heart L.
Red Mtn
Indian Meadows
Coopers L.
Snowbank L.
Cooper
Stonewall Mtn.
TO MISSOULA
Ovando
N. Fk. Blackfoot R.
Arrastra Cr.
Hwy. 200
Lincoln
Blackfoot R.
N

31. Did you feel crowding was a problem in the Wilderness in places you visited?

[ ] NO

[ ] YES → Please note the places you felt were crowded. (A very simple description of the place will be enough; something like, "around Smith Lake," or "on the trail between Jones Pass and Brown River.")

_____

_____

_____

32. How did you feel about the condition of the Wilderness in terms of wear and tear from use, causing erosion and loss of vegetation, and in terms of litter? (Check one box in each row.)

	VERY GOOD	GOOD	FAIR	POOR	VERY POOR	DO NOT REMEMBER
Wear and tear	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Litter	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please describe what seemed wrong, if anything: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

33. Thinking about the Wilderness you visited, how desirable or undesirable do you think each of the following is? (Check one box after each item.)

		Undesirable	Don't care	Desirable	Desirable in more heavily used parts of Wilderness, but not in more lightly used parts
A.	High standard trails (wide, steady grades, fairly straight)	[ ]	[ ]	[ ]	[ ]
B.	Low standard trails (somewhat like a game trail--narrow, grade varies, winding, not the shortest route)	[ ]	[ ]	[ ]	[ ]
C.	Leaving some areas with no trails	[ ]	[ ]	[ ]	[ ]
D.	A few trees blown down across the trail, maybe 1 or 2 per mile	[ ]	[ ]	[ ]	[ ]
E.	Bridges over creeks where hikers would otherwise get wet feet	[ ]	[ ]	[ ]	[ ]
F.	Bridges over rivers that are dangerous for hikers to wade or for horses to ford	[ ]	[ ]	[ ]	[ ]
G.	Outhouses (pit toilets)	[ ]	[ ]	[ ]	[ ]
H.	Cemented rock fireplaces with metal grates	[ ]	[ ]	[ ]	[ ]
I.	Small, loose rock fireplaces (fire rings)	[ ]	[ ]	[ ]	[ ]
J.	Natural forest fires started by lightning	[ ]	[ ]	[ ]	[ ]
K.	Pole corrals at campsites for horses	[ ]	[ ]	[ ]	[ ]
L.	Closing some areas to use by horse parties	[ ]	[ ]	[ ]	[ ]

	Undesirable	Don't care	Desirable	Desirable in more heavily used parts of Wilderness, but not in more lightly used parts
M. Prohibiting wood fires where dead wood is scarce (requiring use of gas stoves)	[ ]	[ ]	[ ]	[ ]
N. Split log picnic tables at campsites	[ ]	[ ]	[ ]	[ ]
O. Restricting the number of visitors to an area if it is being used beyond capacity	[ ]	[ ]	[ ]	[ ]
P. Eliminating grazing by visitors' horses (require carrying horse feed)	[ ]	[ ]	[ ]	[ ]
Q. Requiring all visitors to register when entering	[ ]	[ ]	[ ]	[ ]
R. A natural fishery--no stocking, and barren lakes left barren	[ ]	[ ]	[ ]	[ ]
S. Limiting the size of parties to 12 people	[ ]	[ ]	[ ]	[ ]
T. Prohibiting camping within 200 feet of lakes or streams	[ ]	[ ]	[ ]	[ ]
U. Encouraging visitors to remove fire rings and all evidence of campfires when breaking camp	[ ]	[ ]	[ ]	[ ]
V. Signs along the trail explaining natural features or early history	[ ]	[ ]	[ ]	[ ]
W. Burying unburnable garbage	[ ]	[ ]	[ ]	[ ]

		Undesirable	Don't care	Desirable	Desirable in more heavily used parts of Wilderness, but not in more lightly used parts
X.	Use of chain saws by the administrators to clear trails of trees	[ ]	[ ]	[ ]	[ ]
Y.	A guidebook to the Wilderness	[ ]	[ ]	[ ]	[ ]
Z.	A detailed, accurate map	[ ]	[ ]	[ ]	[ ]
AA.	Issue trip permits so visitors could only camp each night in the area assigned to them	[ ]	[ ]	[ ]	[ ]
BB.	Expect campers to use only dead wood on the ground for campfires	[ ]	[ ]	[ ]	[ ]
CC.	Allow visitors to catch fish to eat in the Wilderness but not to bring out	[ ]	[ ]	[ ]	[ ]
DD.	Packing unburnable garbage back out of the Wilderness	[ ]	[ ]	[ ]	[ ]
EE.	Rangers or patrolmen in the backcountry	[ ]	[ ]	[ ]	[ ]

Did you meet a Ranger in the Wilderness? [ ] NO; [ ] YES

Please comment on any of the items above, if you want to: _____

_____

_____

_____

34. How important or valuable are Wilderness areas to you personally?

[ ] EXTREMELY IMPORTANT

[ ] VERY IMPORTANT

[ ] FAIRLY IMPORTANT

[ ] NOT VERY IMPORTANT

[ ] NOT AT ALL IMPORTANT

35. How well do each of the following statements describe your feelings about your recent trip in the Wilderness? (Please check one box for each statement.)

	Very strongly disagree	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Very strongly agree
This Wilderness trip was better than any other Wilderness trip I remember	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
This Wilderness trip was better than any other outdoor recreation experience I remember	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
This Wilderness trip was so good I would like to take it again	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

We would also like some background information about you. This information is needed to predict future use and to compare different kinds of recreation areas. We respect your privacy--all this information will be kept strictly confidential.

36. How many people were in your party in the Wilderness on this trip, including yourself? _____

How many were in each of the following age and sex categories? (Please put the correct number in each box.)

	up to 14 years old	15 to 24 years old	25 to 44 years old	over 44 years old
MALES				
FEMALES				

37. Were these people: (Skip if you were alone.)

[ ] A FAMILY OR FAMILIES (INCLUDES PART OF A FAMILY)

[ ] A FAMILY PLUS FRIENDS (INCLUDES PART OF A FAMILY)

[ ] FRIENDS AND ACQUAINTANCES (NOT RELATED)

[ ] FROM AN ORGANIZATION (SCOUTS, CLUB, ETC.)

[ ] OTHER (describe _____)

38. Do you belong to any conservation or outdoor recreation clubs?

[ ] NO

[ ] YES ⟶ Which ones? _____

_____

_____

39. Where do you live? And where did you live most of your life before age 18? (Check one box in each column. If you live or used to live in a suburb, answer in terms of the whole metropolitan area.)

	Where do you now live?	Where did you live most of your life before age 18?
ON A FARM	[ ]	[ ]
RURAL OR SMALL TOWN (UNDER 1,000 POPULATION)	[ ]	[ ]
TOWN (1,000 - 5,000 POPULATION)	[ ]	[ ]
SMALL CITY (5,000 - 50,000 POPULATION)	[ ]	[ ]
MEDIUM CITY (50,000 - 1 MILLION POPULATION)	[ ]	[ ]
LARGE CITY (OVER 1 MILLION POPULATION)	[ ]	[ ]

40. What is the highest year of school you have completed? (circle)

ELEMENTARY								HIGH SCHOOL				COLLEGE				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17 OR MORE

Are you still a student?

[ ] NO

[ ] YES

41. What is your occupation? (If retired, also show occupation before retirement.)

What kind of work are you doing? _____

To help us determine occupation, please list your most important activities or duties. _____

_____

PLEASE MAIL THE COMPLETED QUESTIONNAIRE
IN THE SELF-ADDRESSED, STAMPED ENVELOPE.

THANK YOU VERY MUCH!

(If you have any other comments, please write them here. And, thanks again!)

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